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The Journal of Obstetrics and Gynæcology of the British Empire

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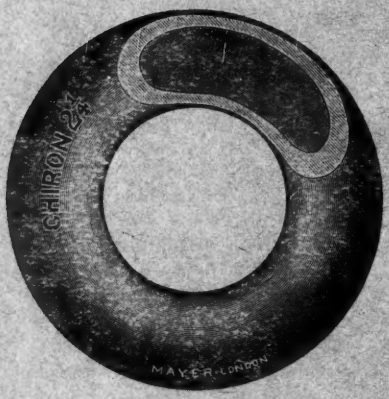

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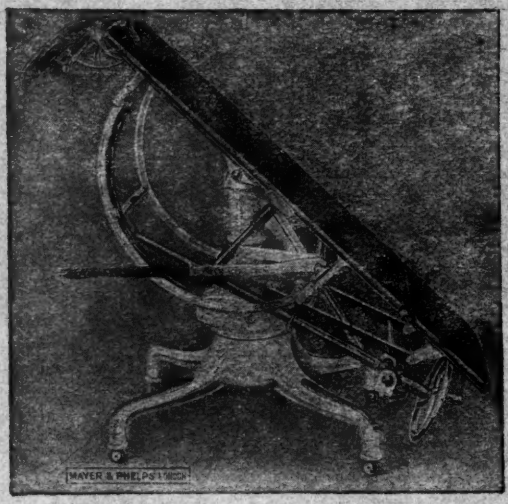

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The Journal of Obstetrics and Gynæcology of the British Empire

VOL 32. No. 3 (New Series). AUTUMN, 1925

Osteomalacia in China

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HISTORY.

THERE is no evidence as to when osteomalacia first appeared in China. We have not so far come across any mention of it in the old obstetrical works, one of which dates back to at least 500 years before Christ. Even in the books belonging to the Kang Hsi and Chien Lung periods, there does not seem to be any recognition of the disease as an entity, and yet it is one which ought to have been recognized, as its consequences are so dramatic and the suffering it causes so great.

It must be remembered that the parts of China which are most cursed with the disease—namely, Shansi and Shensi—are provinces which, in the early days, were very sparsely populated. Northern Shensi is still in this condition, and as to Northern Shansi the disease was certainly there in quantity fifty years ago. Since even in the West it does not seem to have been recognized as an entity before the end of the sixteenth century, it is perhaps hardly surprising that there are no definite records of it in China. The first record in Europe appears to have been one by Lambert in 1700 A.D. (Ribemont-Dessaignes). Subsequently Mme. Supiot, in 1747, and Morand fils, in 1752, wrote on this subject, and in 1768 Cooper performed Cæsarean section for pelvic deformity and obstruction caused by the disease. In the New World the first

case reported is one occurring in Pennsylvania in 1742, a record of which is found in the Royal Society's Transactions for that year.

Distribution.

As far as China is concerned, the distribution is as follows: The heaviest incidence is found in the northern three-fourths of the province of Shansi, the southern limits being Luanfu on the east and Pingyangfu on the west. It is not evenly spread over the province, the incidence being especially heavy about the centre of this region; at Pingtingchow, Shouyang, and Yütze. In these places the incidence is surprisingly marked.

We selected Pingtingchow as the special place for our study of the disease partly because of the high incidence there, and partly because in that city there is a well-equipped Medical Mission Hospital whose head, Dr. F. J. Wampler, has been much interested in the disease and has given us the heartiest help and co-operation, working with us on this question, and its severity there will be readily realized when we tell you that in one week one of us saw twenty-two well-marked cases in part of the city and one of the suburbs. The whole city and suburbs contain about 15,000 inhabitants, and it is probable that at least one in fifty of the women of child-bearing age have, or have had, the disease. We know of one family at Pingtingchow in which three daughters-in-law died one after the other from obstructed labour due to osteomalacia. The Chinese themselves claim that the incidence may rise as high as 10 per cent. of the child-bearing women of adult age. When one takes the hospital records of the capital of the province, Taiyuenfu, which is close to the Yütze region, we find that during the last twelve years there have been close on one hundred Cæsarean sections performed in the Mission Hospital on patients suffering from this disease. A large number of Cæsarean sections have also been done at Taiku, Fenchow, Pingtingchow, and Liaochow. The whole affected area is on a high plateau, 2,000 to 3,000 feet above the sea.

In Shensi it is the northern half of the province which is affected. This is very mountainous. There are few cities and the population is a scattered one. The incidence in this region is probably about 1 per cent. or 2 per cent. of the women of child-bearing age, and there are probably 2 per cent. to 3 per cent. of pregnant women who die in labour from this disease. The lack of a series of vital statistics makes the estimation of these figures a matter of some doubt, but the incidence is undoubtedly very heavy.

The area in Shensi does not extend south as far as the Sianfu line, and speaking generally, is much above sea level.

In the province of Kansu, the middle belt, which is a high tableland, is affected. There have been cases both at Lanchow and Pingliang, but there are very few medical men with Western training in the province, and it is not known whether the incidence is really heavy. From enquiry I doubt whether it occurs in anything like the proportion in Shansi and Shensi. It is also a question whether it occurs to any extent among the Mohammedans.

A letter from Dr. George E. King, of Lanchow, dated June 23rd, 1924, tells one of us that there have been six Cæsarean sections there for osteomalacia during the first half of the year. Another case was waiting for operation as he wrote. One of these cases was in a Mohammedan, so it undoubtedly occurs among them.

The whole of Manchuria is affected with the disease, cases having occurred as far south as Newchwang, as far north as Ashiho, and in the centre as at Mukden and Liaoyang. But it is of a distinctly milder type than the Shansi type, and Cæsarean sections for deformity of the pelvis are much rarer occurrences.

There are also several small areas where the disease is present scattered about the Republic.

There is a tiny area near Changsha, Hunan, where the major trouble for which the patients came to the Hunan-Yale Hospital was deformity of the chest. At the same time one of us investigating on the spot obtained information of one case in this region which had died in labour from pelvic obstruction due to osteomalacia. There have been no Cæsarean sections at the Hunan-Yale Hospital due to this disease.

There is another small area around Kongmoon, in the Canton province, and not only has osteomalacia been seen at that place in Chinese, but an Australian woman developed the disease there. She was married to a Chinese, and had been living with and as the Chinese, so that she was subject to the same causes which act in their case. With the exception of this one, we have heard of no other foreign case developing in China.

Another small area is around Suifu, in the province of Szechwan, and there is another small patch around Kweiteh, in north Honan. Occasional cases occur in Peking and the province of Chihli, and at one time there were a number of cases in an area on the outskirts of Tientsin, but the disease does not seem to be prevalent there at the present time.

Osteomalacia used to be fairly common in Europe, especially in the Rhine Valley, the Danube Valley, and parts of Italy and Flanders, but it is now almost a negligible item in these regions.

Hunger malacia was frequently seen in Austria and part of Germany during 1918, but has now disappeared.

In the East it is found in India, widely scattered. Scott reports its incidence to be heavy in Kashmir and the Punjaub. In Japan it is also present, especially in the province of Toyama, where Ogata met with many cases.

Section II.

General Picture of the Disease.

What is the general picture of osteomalacia as seen in China? One meets with mild cases as well as severe ones. As known by the patient it goes under the name of "Yao T'ui T'eng," or "back and thigh pain." In some cases pain in the lumbar region precedes that in the thighs. It is of an aching character, coming and going, better some days than others, and worse during the winter months than in the summer. There may be pain alone and apparently no bone change, although even in these cases, on X-ray examination, there is evidence of the disease in transparency and mottling of the bone-shadows.

As a rule, however, the trouble progresses and the bones become distinctly tender, especially over the lower ribs and the pelvic girdle. The bones become soft in spots and the incidence of the disease on various areas of the bony system is erratic, and we cannot as yet explain the reason for the differences. One woman may suffer in the pelvis alone, another in the chest, and a third in both. There are also alterations in the long bones, so that a marked coxa vara may be produced, quite apart from the bendings which may appear in humerus or femur or elsewhere.

The affection of the pelvis takes a characteristic form. The sacrum becomes shortened by the development of a marked convexity backwards, so that the lower part tends, with the coccyx, to come forward and narrow the outlet; the acetabula are carried inward; the symphysis pubis splayed outward; and the descending rami of the pubes and the ascending rami of the ischia tend to approximate so that the vaginal outlet is almost blocked. The tuberosities may actually touch, and tend to be carried a little backward, so that the outlet of the pelvis may be reduced almost to the vanishing point. The upper strait of the pelvis becomes triradiate, and the last lumbar vertebra may slide a little forward, possibly aided by the alteration in the shape of the sacrum.

In the chest a lateral curvature with some rotation of the upper dorsal spine takes place, and the neck seems to sink into the upper portion of the chest, thus reducing the height by several

inches. The chest itself tends to become barrel-shaped, the sternum crumples up, curves forward, and forms a marked prominence on the front of the chest wall, the distance from the suprasternal notch to the ensiform cartilage being reduced, in a bad case, to two inches or under.

The result of this deformity of the spine, combined with a developed weakness in the muscles, is that the patient tends to walk less and less, and sits on the "kang"* in a characteristic attitude, bending slightly forward and resting the weight of the head on a pillow. In some cases we have known, this attitude had been maintained for the best part of the year. The patient may come to the hospital complaining of inability to walk and thinks that she is suffering from paralysis.

In the long bones irregular curves take place, but as a rule these are distinctly rarer than the changes in the chest and pelvis. Fractures are not a marked feature of the disease in China. There is generally a little inflammation about the alveolar edge of the gums, not due to pyorrhœa, and in one case we specially studied this made eating difficult. Apparently the teeth are not directly affected, but the jaw is affected, so that the teeth, although perfectly healthy, tend to become loose and some of them may drop out. If they do not drop out, as the patient recovers they again become firm. Tetany is very common. Probably the majority of patients suffer from it at one time or another. Of the last four cases which were specially studied, three of them confessed to have had tetany. The fourth one declared that she had never had it, but she had a typical attack while under study in the hospital. The spasms may last for hours and then leave a numbness in the legs and arms. Or there may be the development of a numbness called by the people "ma mu," which is closely allied to tetany and often precedes it.

What is the ordinary history of one of these cases? A typical history would be as follows: First pregnancy, normal. Second pregnancy, pain during last few months, normal labour. Third pregnancy, pain beginning early in pregnancy, say about the third month, craniotomy or the forceps needed at time of labour. Fourth pregnancy, pain as already described but more severe, a difficult craniotomy or a Cæsarean section needed, birth of a living child in the ordinary way impossible.

This is the usually accepted text-book picture, and one meets many cases that correspond to it.

* The "kang" is a heated platform on which the ordinary person in North China sleeps. It is built of brick or dried earth-brick, and is heated by flues running in both a longitudinal and a transverse direction. It may be stoked from outside the house or from inside, and the fuel used is coal or sorghum stalks.

But is this the normal course of events? Can one not go further back and find an earlier history? We believe that we can, and in this our opinion is borne out by King of Kansu, who speaks of the disease there as being one of girls before marriage, becoming worse or *recurring* in the pregnancy period. Wampler, of Pingtingchow, has also remarked to us on the number of cases in which there seem to be symptoms of osteomalacia during the puberty period. Further, and we throw this out more as a suggestion which we will again mention further on, it is possible that some at least of the funnel pelves are really the result of a mild puberty osteomalacia.

One of our most marked cases is that of a male in whom the symptoms began just before puberty, anl we know of one very well marked case in a woman in Pingtingchow in whom symptoms began at the age of 12—13.

But we are fortunately able to go further in this direction. Just before leaving Peking there came into our hands a paper by Mr. Liu Shih Hao, a student in the Peking Union Medical College, on two cases of tetany occurring in girls from an orphanage near Peking. Nothing had been noticed about the bones save that the X-ray evidence of rickets was absent. Considering, however, the history of tetany, the low blood calcium and the age of the girls, it was arguable that here were two cases in which there might very possibly be evidence of commencing osteomalacia. We sent for them back, had X-ray pictures taken of the pelvis and the latter measured. The measurements were as follows:—

Case 1.—Pai Jui Feng, æt. 15. Interspinous, 21; intercristal, 22; external conjugate, 14; interischial, 6.

Case 2.—Li Fu Chen, æt. 16. Interspinous, 22; intercristal, 24; external conjugate, 16.5; interischial, 6.5.

The bones were markedly calcium short, and gave weak pictures, and in the case that is most serious, a distinct deformity of the pelvis is already present. These cases will be further discussed when we come to the question of ætiology.

These cases show that it is probable that quite a number of young girls may have mild attacks of osteomalacia without their being suspected.

The disease may appear in the first pregnancy, and may progress so fast that a Cæsarean section may be necessary at the time of the first labour. Or the disease may appear in several successive pregnancies without causing much difficulty at labour, and then suddenly take on malignant characters, so that it is impossible for the next labour to take place naturally, and the

only hope of the woman and child is a Cæsarean section. As a rule the disease clears up after lactation is complete, and may recur again and again; but some of the victims seem to have symptoms over many years, and in a minority the disease begins and steadily progresses, making the patients bed-ridden invalids, till they die of asthenia, or some intercurrent affection. Some of them die of pneumonia, but the affection follows no fixed course.

In a certain number the main symptoms of the disease appear immediately after the stopping of the calcium drainage or after the strain of labour, and may progressively increase for a time in spite of treatment. This is what McCrudden calls "over-production." As a rule, when the cause of the calcium drain ceases to become effective, there is a fairly rapid recovery from the condition with the disappearance of symptoms, even though the calcium loss in the bones may be gradually replaced. But in some cases the original cause seems to go on acting for a time in spite of the withdrawal of the stimulus, and this may explain the uncertain result of efforts in the direction of treatment.

Take for instance the following case, which also illustrates the rarer manifestations of osteomalacia in which the main symptoms seem to be referable to the soft parts. Here is a woman who in each succeeding pregnancy has suffered in increasing severity from the pains which are such a marked symptom of the disease, without the bones being markedly affected. There seems to be little doubt that one is dealing with a manifestation of this disease, the only tangible symptoms being the pain, increased reflexes and a diminution in the blood calcium.

Case No. 3928.—Li Hau Shih: Age 31, native of Chihli (Lanchow region). Family and past history good. Married when she was 25 years old. No dysmenorrhœa or leucorrhœa. A child was born in her 25th year, a second in her 27th year, a third in her 29th year, and a fourth in her 31st year. All four children were born at full time and are still alive and well.

The first three children were breast fed, at least for a number of months; the last one was only fed for a day or two at the breast.

In the first pregnancy the pain of osteomalacia began about two weeks after childbirth, and consisted of aching in the lumbar regions. It gradually disappeared and was gone after a year.

In the second pregnancy the pain came on at about the same time and lasted three months. It was more severe than in the first pregnancy.

In the third pregnancy the pain came on about the same time,

but its distribution was wider in area, spreading into the thighs. it lasted five months, and was worse than in the second pregnancy. In spite of the pain she was able to get up and about during these three lactation periods.

In the fourth pregnancy the pain came on three days after childbirth and gradually spread, till after twenty days she had pain in her back, arms and legs. The pain was intermittent and aching, varying in duration from a few minutes to several hours. She was able to walk about with difficulty for about three weeks, and since then has been lying down owing to pain and weakness.

The muscles seem to be tender; the reflexes are a little increased; the electrical reaction of the muscles is normal. The grasp of the hand is weak and the patient does not move very readily. By the X-ray the bones are normal, save that they are a little more transparent than is usual. The blood is normal save for the blood calcium which, on admission, was only 6.8 milligrams per 100 cc. serum. The urine is normal. The joints appear to be perfectly normal and there is no œdema. The gums are a little inflamed, but the teeth are in good condition and there is no pyorrhœa. After three weeks in the hospital under treatment the blood calcium was 11.3 mg. per 100 cc. serum, that is, the normal figure. The pains were gradually diminishing and the patient was sleeping and eating well.

There are cases in which the weakness of the muscles seems to be the symptom of which most complaint is made, and patients may seek advice complaining that they are paralyzed and cannot walk. Two such cases have come under our notice lately. Whilst away from Peking one of us was appealed to on behalf of a patient who was said to have gradually become paralyzed three months after labour. One of our assistants was sent to investigate the case, and we speculated on its being an early one of osteomalacia. The report was not full enough to be certain of the diagnosis, but our assistant had put her on large doses of cod liver oil and calcium lactate, and she walked into our consulting room a fortnight to three weeks after this date.

In June, 1924, we had in the wards a woman who presented a typical picture of osteomalacia and had come down from Northern Shansi, a day and a half's journey to the hospital, as a case of paralysis.

To sum up this section: Osteomalacia is due to more symptoms than its name would imply. Contrary to the usual belief, it often begins about the age of puberty, and besides bone deformity within the pelvis and the chest, there are marked symptoms referable to the nervous system, the muscles and the teeth.

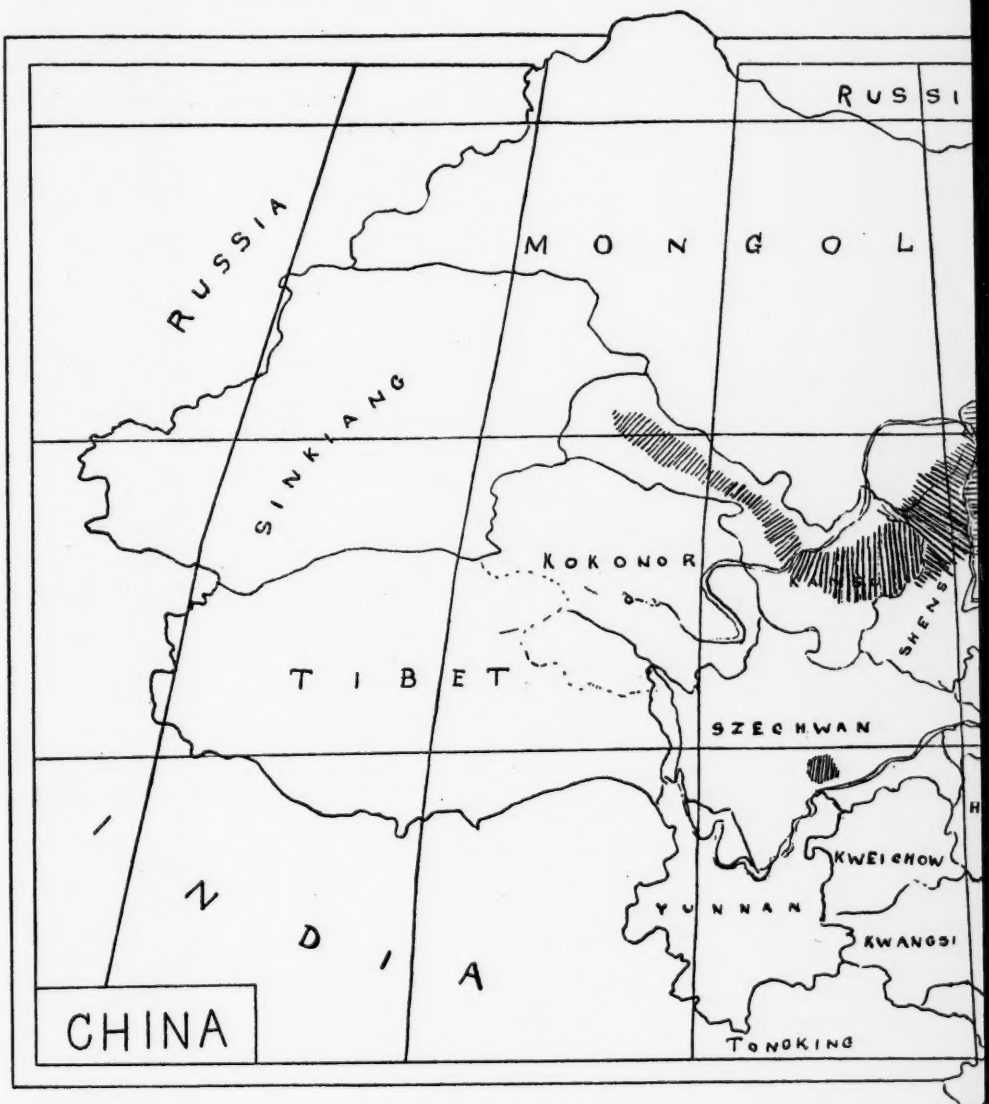
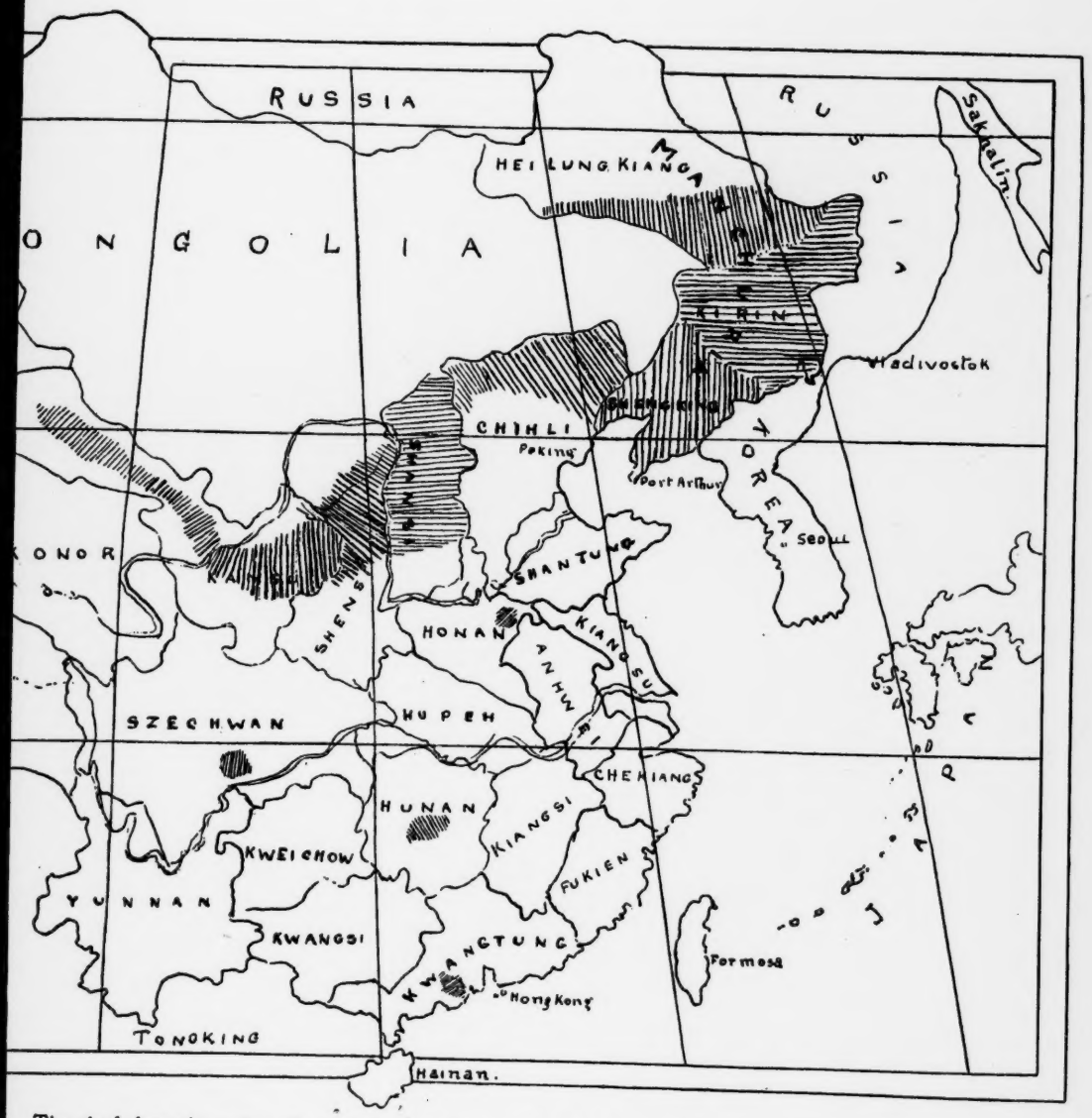


Fig. 1.—Map of China. The shaded portions show the distrib



The shaded portions show the distribution of osteomalacia (Maxwell).

Section III.

The Fœtus in Cases of Maternal Osteomalacia.

Some of the questions which arise in connexion with this disease are the following: What is the condition of the fœtus when the mother has osteomalacia? Does it suffer with the mother or is the entire brunt of the disease borne by her? If it suffers, considering the close relationship between osteomalacia and rickets, is there any evidence of prenatal rickets?

Having been unable to find any papers dealing with this subject we first of all took up this question under the impression that the entire brunt of the disease was borne by the mother. Apparently this is by no means the case. Seven fœtuses, delivered by Cæsarean section from mothers with obstructed labour due to osteomalacia, have been carefully examined. Five of these were at full time, the sixth at about seven and one-half months, and the seventh at eight months. All these fœtuses came from pure Chinese mothers; and for purposes of comparison bones from eight fœtuses, which were born of normal Chinese mothers and died from accidents of childbirth, seven being full time fœtuses and the eighth an eight months' fœtus, were also examined.

Roentgenograms show that the proper centres of ossification are present. Two out of three of the fœtuses, however, from mothers with active osteomalacia, showed curious changes about the ends of some of the bones, especially the ulna, the main change being an apparent cupping of the end of the bone, which at once suggested the possibility of this cupping being rickety in nature. There is not, however, in the Roentgenogram the irregular outline characteristic of a rickety cupping. The mothers of the other four were apparently suffering less from the disease than from the deformity.

The next step in the investigation was to remove specimens of these affected bones, the radius and ulna being selected. It was noted that the bones appeared to be a little smaller and possibly lighter than the normal, and that they could be split with a knife with greater ease than is usual in those coming from a normal fœtus. For comparison the same bones were also removed from a normal fœtus, which had died at full time from an accident of labour. The bones in this case were larger and harder. Even if some of these have certain differences, due to the size of the woman and the tendency of some women to have larger children than others, there is no doubt that the balance is heavily against the bone from the fœtus conceived by the mother with osteomalacia both as regards size and hardness; and to a less degree as to weight.

Sections of these bones were now prepared and stained in various ways, and the following facts became at once evident:—

1. The amount of osseous tissue in the bone coming from the normal control was much greater than that in the osteomalacic fœtus. In other words, the bone from the fœtus in osteomalacia was ostein short.
2. In the specimen from the fœtus in osteomalacia the chondrin stained faintly, almost certainly due to a shortage of chondrin and a poor quality of chondrin.
3. In the normal control the zone of calcification was present, whereas in the bone of the fœtus in osteomalacia this zone was hardly, if at all, visible. There was no irregularity of the zone of calcification, nor a linking of the cell columns, such as one finds in rickets; and the appearance of the specimen rather bore out the *dictum*, that even if the diet is deficient in the proper proportion of its elements, the child will not develop rickets if the supply is at a starvation level. The appearance is more that of osteoporosis.
4. The apparent cupping of the ulna was due to a little advanced calcification on the two sides of the section below the periosteum.

TABLE I.

ANALYSIS OF FOETAL BONES - 1ST SERIES

Normal	Fresh Weight	Dry Weight	Ash Weight	Moisture per thousand	Organic Matter per thousand	Ash per thousand
1	15.885	5.0184	2.2176	690.375	170.022	139.603
2	15.180	4.678	2.0678	691.832	171.890	136.278
3	13.179	4.311	1.920	671.889	181.431	145.680
4	16.830	4.3237	1.7972	742.918	150.291	106.791
Osteo-malacia						
1	15.192	3.9022	1.3352	749.724	162.388	87.886
2	16.052	4.103	1.3861	744.394	169.256	86.350
3	7.895	1.708	.5925	783.382	141.571	75.047

Normal	ANALYSIS OF ASH Calcium per 1000	Phosphorus per thousand	Magnesium per thousand	Osteo-malacia	Calcium per thousand	Phosphorus thousand	Mg. per thoumnd
A[x]	382.5	178.66	4.35				
1	388.66	184.76	13.22	1	380.65	188.04	4.60
2	383.2	189.05	11.38	2	373.88	186.88	2.16
3	277.22	187.79	8.61	3	364.20	186.47	8.10
4	379.64	187.12	2.48				

x Analysis of normal adult bone ash (femur) calculated from table on page 436, Hammarsten Physiological Chemistry Ad. Carnot.

TABLE II.

ANALYSIS OF FOETAL BONES - 2ND SERIES

Normal	Sex	Weight	Duration of Pregnancy	Fresh Weight Femur	Dry Weight Femur	Ash Weight	Moisture per Thousand	Organic Matter per Thousand	Ash per Thousand
1	Male	2675	Term	16.175	4.9926	2.0908	691.34	179.40	129.26
2	Male	2315	Term	10.5540	3.1305	1.9818	703.38	187.78	108.84
3	Male	1730	8 Months	9.544	2.7676	1.1306	710.01	171.53	118.46
4	Female	2730	Term	15.053	4.3800	1.5635	708.68	187.33	103.99
			Foetuses from Mothers suffering with Osteomalacia						
1	Male	2350	Term	13.115	4.3977	1.7190	664.68	204.24	131.08
2	Female	2678	Term	16.085	5.0390	1.7898	686.73	202.00	111.27
3	Male	1695	8 Months	8.585	2.6552	1.0246	690.71	189.94	119.35
4	Male	2296	Term	16.570	4.9505	1.6053	701.23	201.89	96.88

Calcium and Phosphorus in the Ash - 2nd Series

Normal	Calcium per Thousand of Ash	Phosphorus per Thousand of Ash	Calcium per Thousand Bone	Phosphorus per Thousand Bone.
1	368.67	184.64	47.78	23.87
2	400.65	197.15	43.61	21.46
3	382.69	193.66	46.52	22.94
4	393.78	191.56	40.95	19.92
		Osteomalacia		
1	367.49	190.35	48.17	24.95
2	375.14	195.21	41.74	21.72
3	387.54	188.80	46.24	22.53
4	370.37	187.26	35.88	18.14

Turning from these appearances to the analysis of fœtal bones carried out by one of us (Miles), ample confirmation of the facts which have already been stated is found. The femur was taken as the test for this purpose, was carefully cleansed from all extraneous material and then analyzed, the result being given below.

The first table shows the results of one set of analyses, the second the result of a second set carried out a year later with an entirely new set of fœtuses.

When one looks at the first set of figures, it will be noticed at once that the proportions of the salts to one another as regards calcium and phosphorus are unaffected, but the difference in the ash per thousand is very marked, and one may safely say that there is a definite calcium and phosphorus deficiency as compared with normal bones. It is also clear that although there may be a retention of sulphur and magnesium during the active state of the disease the bones of the fœtus do not show it, as the magnesium count in the osteomalacia cases is distinctly low.

In the second set of figures this does not show up so clearly

except in the case of the last fœtus from cases of osteomalacia, but it will be noted that the femora of the babies from osteomalacia mothers are relatively heavier in this series than those of the normal controls, the principal difference in weight being in the increased amount of organic matter in the bones.

It would seem from the two sets of analyses that the fœtus fails to get enough calcium when the mother's blood is deficient in this mineral. In considering the apparent variations in the figures it must be borne in mind, as we have already remarked, that it is difficult to be sure of the exact condition of the mother in these cases. Some of them at least were suffering more from the effects of old osteomalacia than from the disease itself, which has a considerable bearing on the figures obtained.

We know that as regards the first set of analyses the mothers all presented signs of active osteomalacia, but as to the second set of figures we are only sure of fœtuses 1 and 4. Fœtuses 2 and 3 certainly came from mothers in whom the disease was arrested.

As to the living, a fœtus delivered by Cæsarean section from a marked active case of osteomalacia, showed at the age of one and a half months certain changes in the ends of the femora.

The note concerning this child is as follows : Baby Chi (Mother's No. 2089), No. 2123. Peking Union Medical College Hospital. Cæsarean baby (for osteomalacia); carried very high owing to shape of pelvis. The child was very fond of lying almost prone with its knees drawn up. When one and a half months' old an X-ray was taken. There were slight changes in distal ends of femora. Dr. Hodges suggested that the child had rickets or lues. TheWassermann reaction was negative and the history of mother clean. Dr. Brackett examined specially for rickets, and confirmed our opinion that there were no clinical signs of this disease; he doubted whether X-ray findings were those of rickets, though he was not prepared to diagnose the cause of the slight changes in the femora. The baby went home fat and well, and was in good health two and a half years later, with no signs of rickets.

Dr. Hodges' report was as follows : " Stereoscopic films show more clearly the change in the distal ends of the femora suggested by flat films made on June 2nd. The changes consist in a flattening of the diaphyseal ends of the bones, but without any cupping. Probably rickets, possibly lues."

It is a question whether some of these children if placed under favourable conditions may not develop some of the Roentgenographic appearance of rickets as they recover from the osteomalacic influence. Dunham has published the account of such a case in which there is no doubt that the condition of the mother had a definite influence in the early appearance of rickets in the infant.

If there is a definite calcium surplus in the full time fœtus in normal circumstances and a deficiency of this surplus in premature fœtuses (Hamilton), then one might expect that these fœtuses from mothers with osteomalacia would behave like premature fœtuses in exhibiting in a greater proportion than normal full time fœtuses symptoms of rickets early in life.

Dr. Alfred Hess kindly allows me to mention that in a series of Roentgenograms of neo-natal children he has found a certain amount of cupping of the ulna in about one in twenty of the cases. Exactly what interpretation is to be placed on this cupping is at present uncertain.

One notices when these children are born that the subcutaneous fat is deficient and the skin tends to be wrinkled, but this condition rapidly improves and otherwise the children appear to be perfectly normal. Another interesting point is that at the operation of Cæsarean section in mothers with osteomalacia, the omentum will be found to be shrunk and practically devoid of fat.

One may ask what is the condition of the blood of these fœtuses as regards the proportion of calcium. Here again one has carefully to distinguish between fœtuses born from mothers who have active osteomalacia and those born from mothers who have fully recovered from the disease. Apparently there is little divergence from the normal in these latter cases, and our figures for the calcium in the cord-blood average about 10.3 milligrams of calcium per 100 cc. of serum.

We have not enough data to be able yet to speak about the proportion of calcium in the cord-blood of fœtuses from cases of active osteomalacia.

Hess and Matzner give us a normal figure for the cord-blood 10 75 mgm. per 100 cc., and Bogert and Plass give 10.9 mgm. per 100 cc.

Conclusions.

(1) There are definite changes in the skeletal system of the fœtus born from mothers who are the subjects of osteomalacia.

(2) These changes are especially marked about the growing ends of the long bones and consist in a shortage of osteïn, a poor quality of chondrin and an absence of a proper zone of calcifcation.

(3) When the bones are analyzed, although the elements are contained in their proper proportion, there is a general deficiency of the salts which should be present in a normal bone.

(4) There is no evidence of pre-natal rickets.

(5) The centres of ossification are apparently normal in position and time of appearance.

(6) The cord-blood calcium in fœtuses from cases of healed osteomalacia show little divergence from the normal though the divergence is in the direction of shortage.

Section IV.

Ætiology.

Let us first try and clear the ground a little. Has the geological formation anything to do with the distribution of osteomalacia?

By the kindness of Dr. Ting, late of the Geological Department of China, we were able to secure a map of the Shansi formation. It has already been stated that the whole region is about 2,000—3,000 feet above the sea. Looking at the map one sees that a large number of the cases occur on loess formation, and on limestone, a further number on the sandstone, and in the north of the province over the archæan. There does not seem to be any selection of the areas covered by these formations in the incidence of the disease.

The water mostly falls away to the East and to the West, entering the Yellow River on the one side, and the rivers running into the Gulf of Pechihli on the other. The drinking water is mostly obtained from shallow surface wells, and the people as a rule drink little unboiled water. So that we think we may rule out the actual geological formation as having but little to do with the disease. The altitude, of course, causes the winters to be longer and more severe, and increases, especially in the case of bound-footed women, the confinement to the house.

Next let us consider the state of the ovaries. Although not generally put in this bold way, the ovaries have been considered as the cause of the disease, and their removal advocated on this ground. There is no evidence worth the name which proves the disease to be connected with pathological changes in the ovaries. One of us has carefully examined ovaries taken from active osteomalacia cases at the time of a Cæsarean section, and compared them with the ovary removed from a Cæsarean section case for another cause, and failed to find any histological difference. This entirely confirms the observations of previous observers as to the absence of histological changes. The mere fact that castration is followed by the clearing up of the main symptoms of the disease proves nothing. In some cases the immediate calcium loss has, after castration, been greater than before; and it is probable that castration, acts merely by preventing another pregnancy (which can be as easily done by tying the Fallopian tubes), and by arresting menstruation, which, of course, is a theoretical gain, as it stops the monthly drain of calcium. Against this theoretical gain has to be placed the premature menopause with its mental influence on bodily health. We do not remove the ovaries if sterilization is

needed. We tie the Fallopian tubes if the patient does not wish for any more children, but if she did, we would have no hesitation in allowing a further pregnancy, even in cases of severe deformity, and delivery by Cæsarean section, assuring the woman that the disease would not again arise under proper treatment. And we have put this advice into practice without any recurrence of the disease following.

One of the latest theories as to ætiology is that of McCrudden. "Just as the subcutaneous fatty tissue acts as a store of fat and the liver glycogen as a store of carbohydrate, so the skeleton acts as a store of calcium salts, to be called on in time of need. During the later months of pregnancy and during lactation, the need for calcium salts is great, greater than the intake in the food, and it becomes necessary to draw upon the calcium supply in the bones. The result is that the new bony tissues laid down to replace old bone as it disappears, is poorer in lime salts than the normal. Ordinarily the quantitative change in the composition of the bones is not enough to produce symptoms. At the end of gestation and lactation when the extra need for calcium has ceased, normal bone is again laid down."

Hanau has brought forward some proof of this being the case and of there being a true physiological osteomalacia. But this theory only covers part of the truth. If the disability was as simple as this, one would only have to supply the calcium deficiency and all would be well.

There are two points which may be brought forward as controverting this simple view of the disease. *The first* is that in clinical practice it is not sufficient to supply only a sufficiency of calcium. For example, in one of our cases studied, although it was possible by the administration of calcium with vegetable oil to increase the blood calcium, yet this did not suffice to turn the negative calcium balance into a positive one, and the drain went on as before.

The second is that the theory fails to take into account the fact that a great many cases begin about puberty, when, although there is a calcium demand, this is not sufficient by itself to start the disease. And there are a few cases which appear to start after the menopause.

It will be recalled that three factors are believed to act in the case of rickets, a disease closely allied to osteomalacia; in fact, Von Recklinghausen states that they cannot be morphologically distinguished, when the histological appearances of the affected bones are alone considered. This, however, must be accepted with reserve, as it certainly does not apply to the areas of growth at the ends of the long bones.

These three factors are:—

(1) A deficiency of diet,
(2) Lack of sunshine,
(3) Lack of movement.

To these three may possibly be added—(4) A toxic influence due to some change connected with the ingestion of certain forms of protein, as has been noted in experimental work by Mellanby. Reduced to another form, this implies that one must have for health:—

(*a*) A sufficient supply of salts, and suitable protein and carbohydrate;
(*b*) A sufficiency of the necessary vitamins;
(*c*) An activator for calcium metabolism, and this is bound up with the question of sunlight and movement.

Let us consider first the question of food:—

What is the ordinary food of these people? In their homes they live on a very meagre diet of cereals with a limited quantity of vegetables, and, as a rule, no meat, milk, or eggs; and but little animal fat, the oil used for cooking being mainly vegetable. The principal article of diet is millet, which is eaten at least once a day in the form of a thin gruel made of the whole seeds which have been partially hulled and boiled in water; and to this water is sometimes added a few small pieces of onion or garlic. A small quantity of salted vegetable, such as a variety of turnip or radish or bean leaves which have been preserved in brine, will be eaten with this gruel as a relish. About 15 to 20 grammes of this salted vegetable will be consumed at a meal.

Millet may also be prepared by dry steaming and produces a dish somewhat like steamed rice. But in the majority of instances it is consumed as gruel, and during the first month after labour this millet gruel in small quantities (not over four ounces of millet a day) may be the sole food.

Wheat flour products are eaten once a day by those who can afford the luxury. Steamed bread is made of wheat flour, or the dough is rolled out thin and is baked in large, flat, unleavened cakes. A third favourite way of eating wheat flour is in the form of noodles and usually in the noodles a proportion (usually about 25 per cent.) of flour made from green soy beans is added. This wheat flour varies from a white modern milled flour to a whole milled flour.

Occasionally oatmeal flour is used, in the form of ground oat-

meal which has been partially roasted, but it does not form a main element in the food.

There are but few vegetables. A form of cabbage, marketed in the West as Chinese celery-cabbage, is eaten in large quantities throughout North China, but in the region affected by osteomalacia, which is mostly, as one has said already, on a high plateau, the season is short and the cultivation far from extensive. Thus the supply is limited and the price high, and as a consequence poor people and women get little of it. It is eaten boiled or fried, and the valuable green outer leaves are stripped off and little eaten, the bleached inner leaves being the most esteemed. Onions and garlic, salt vegetable prepared from the leaves of the soy bean, the leaves and stalks of the mustard plant, and a gourd which grows well on the Shansi highlands are eaten. Small quantities of bean curd are also eaten by those who can afford it.

For cooking the fried portion of the diet, sesame oil is mainly used and a small amount of hemp oil.

In order to make matters certain on the question of food and its relation to the disease, one of us (Miles) on two occasions spent a month in Pingtingchow working at this subject. On the first occasion (in 1923), although one obtained reliable blood estimations from 10 patients, it was found to be impossible to be sure of the accuracy of the analyses of the urine, fæces, and food. So a second trip was made in 1924, and on this occasion he was accompanied by a skilled chemist, Mr. C. T. Feng, of the Union Medical College, Peking, who is also an able Chinese administrator. We had previously learned the quality and quantity of the food which these patients were getting. Four cases, which were active, were chosen for the investigation and admitted to the hospital free of charge. And here the first difficulty was met. These women knew that they were in for investigation, and at our expense, and that we could cure them by medicine, and they wanted better food than they got at home. Finally, a satisfactory compromise was come to; and the diet which they got, although a little better than the normal one, was still sufficiently near it to make the test a real one. The patients were allowed as much as they liked to eat, and this was measured for a day or two. Then measured quantities were served out to them, so that they would consume all that was given, and the urine and fæces were carefully analyzed. This went on for 14 days, and then, after a few days' rest, they were put under treatment continuing the same diet for another 14 days, whilst under the influence of the treatment. The results of the treatment and analyses are given below.

First let us take the table which represents the more valuable results of the first year's work.

TABLE III.

Patient Number	Blood Calcium in mg. per 100 cc. serum.	Blood Phosphorus in mg. per 100 cc. plasma.	CO_2 combining power of plasma reduced to 0°C & 760 mm. pressure
1	5.2	2.5	51.3
2	6.0	1.9	57.0
3	7.4	1.8	47.5
4	5.6	2.3	54.1
5	5.8	3.0	51.3
6	7.0	3.8	54.1
7	5.8	3.4	52.2
8	7.0	2.4	49.4
9	5.0	2.0	54.0
10	5.4	3.2	56.0

It will be seen that there is a marked deviation from the normal calcium content of the serum, this being in some cases less than half the quantity considered as normal, and in the highest determination being only about three-quarters of the normal. The phosphorus in the blood varies greatly, some of the patients showing a marked deficiency while others come within normal limits.

The degree of variation from the normal in blood calcium and phosphorus seem to depend directly on the severity of the disease and its duration. Salient points in the histories of these patients, together with their pelvic measurements, are presented in Table IV. It will be seen that in the three patients 3, 6 and 8, in whom the disease had been present one year or less, the calcium content of the blood and the phosphorus content of the blood is more nearly normal than in any of the others, and also that the degree of pelvic deformity is not so great. Further, it is revealed that, while most of the patients had symptoms first during lactation, two of the patients had never been pregnant, in one of whom the symptoms came on about the menopause; another had two early abortions before the fœtus could have caused a severe calcium drain; and in another the disease began at the onset of the menstrual function. The menstrual flow in these patients was uniformly scanty and the cycle irregular. It would, therefore, seem that the added drain on calcium due to pregnancy and lactation is not an absolutely essential factor in producing the disease, and though it undoubtedly may play a part, it is not the sole cause. Nor does it appear that the function of the ovaries or the menstrual function play a

major *rôle*, as in all of these patients the ovarian function is faulty, as evidenced by scanty menstruation and irregularities in the menstrual cycle.

TABLE IV.

Patient	Age	Duration of Disease	Number of Pregnancies	Relation of onset of disease to pregnancy	Tetany	Pelvic Measurements				
						Inter-spinous.	Inter-crystal.	External conjugate.	Inter-ischial.	Inter-trochanteric.
1	23	5 yrs	None	None	No	24	26	18.5	2.5	25
2	57	10 "	None	None	Yes	22	25.5	18	3.0	23.0
3	30	8 mos.	2	During last lactation	Yes	23	24	17	7.0	25.5
4	34	20 yrs.	5	Began before 1st pregnancy at onset of menstruation.	Yes	20	23	21	3.0	22.0
5	32	12 "	2	After first delivery	No	20	25	17	2.0	24
6	35	1 year	5	During last lactation	Yes	22.5	26.5	20.5	6.0	30
7	25	7 yrs.	3	During first "	No	21	25.5	19	3.0	22
8	19	1 year	1	During lactation. Pregnant 3 mos. on admission. Marked exacerbation of all symptoms. Aborted in hospital	Yes	19	23	19	9	29
9	37	9 yrs.	2 abortions	None	Yes	21	27	19.5	3	29
10	24	6 "	3	During first lactation	Yes	--	--	--	--	--

After completion of the blood analyses on the standard diet nine of these patients received treatment as follows, remaining on the same food: Patients numbers 1 and 4 took cod liver oil 30 cc. and calcium lactate 2 grams per day; patients numbers 2 and 3 had calcium phosphate 3 grams per day; patient number 5 had calcium lactate grams 2 per day; patients 6 and 8 were placed on a liberal diet including milk, eggs and plenty of fresh vegetables; patients numbers 9 and 10 took 30 cc. of cod liver oil per day. Patient number 7 left the hospital at the end of the first period. After the patients had received this treatment for 12 days the blood was again analyzed for calcium and phosphorus, and the results are presented in Table V.

It will be seen that the four patients to whom was given cod liver oil, either alone or with calcium salts added, all show a net gain in blood calcium as compared with the results of the first

TABLE V.

Patient	Blood Calcium	Blood Phosphorus in mg. per 100 cc. plasma
1	6.0	2.61
2	5.8	2.9
3	8.7	1.0
4	6.21	3.5
5	7.7	2.3
6	4.6	4.1
8	6.6	3.57
9	6.6	2.95
10	7.57	1.95

estimation; those receiving calcium salts with no oil also showed an increase in blood calcium in two cases and practically the same amount in the third case as in the first estimation; the two patients on liberal diet both show a decrease in blood calcium content. The phosphorus content of the blood seems to vary with no regularity.

The clinical results were also suggestive in that the four women who were treated with cod liver oil, alone or combined with calcium lactate, said that they were much improved and that their pains were less even after such a short treatment, and we observed that these patients moved about the ward and took more interest in life than they formerly had. Patient number 2, who took only calcium phosphate, was decidedly worse, complained more of pain and could hardly move. Patients number 6 and 8 on liberal diet were both clinically worse than at the beginning of the experiment. As these women were both suffering from an early acute attack of the disease, the result is not strange and in addition patient number 8 had a spontaneous abortion of three months' fœtus and did not take her diet well after that occurred.

As has been already said the first year's work was not entirely satisfactory, and so the second year's work was undertaken.

Ten patients were found to be too many to manage satisfactorily and so four patients were chosen. Full details of those patients are given in Miles' paper and the results are here summarized only. They were all marked cases of osteomalacia with deformity, and the salient points are given in the following table:—

TABLE VI.

Patient	Age	Duration of Disease	Onset	Pregnancies	F.H.	Tetany	Pelvis	Chest
1	31	12 years	1st pregnancy	6 2 living first & last Caesarean section	Mother had Osteo-malacia	Yes	Seriously deformed	Deformed
2	29	6 years	1st puerperium	1 Child died after a year	No	Yes While in Hospital	Seriously deformed	Moderate deformity
3	37	15 years	1st pregnancy	5 1st two living. Last 3 still born	No	Yes	Seriously deformed	Moderate deformity
4	49	8 years	No pregnancy	---	One sister	No But reflexes exaggerated	Seriously deformed	Deformed

These four patients were put on the following diet, which approximates closely to their normal diet when at home:—

TABLE VII.

Average daily ration

Breakfast
133 grams of wheat flour in the form of steamed bread
50 grams of millet in gruel
10 grams of salt turnip

Dinner
150 grams of wheat flour made into a thick dough, rolled thin and baked
170 grams of Chinese celery cabbage
8 grams of garlic (boiled together)

Supper
100 grams of wheat flour
30 grams of green soy bean flour rolled into noodles and boiled
40 grams of mustard leaves and stalks
8 grams of garlic (boiled together)

It may be asked: What is the caloric value of such a diet? The protein amounts to approximately 25 grams per day. Fat (allowing a little sesame oil used in frying) is 10 grams per day. Carbohydrate amounts to approximately 337 grams a day. This gives a total caloric value of 1587.7 per day. It is a little lower than one of us (Miles) estimated in the paper specially written on these experiments, but is probably more accurate.

The figures for the various foods, kindly given us by Miss Huang, the dietitian at the Peking Union Medical College, are as follows:—

TABLE VIII.

Chinese foods used in Osteomalacia experiments.

Percentage Composition

	Prot.	Fat	Carb.	Calories
Wheat flour	10.8	1.1	74.8	352
Bread white	9.2	1.3	53.1	261
Millet	9.2	.2	76.6	354
Pai tsai (Chinese Celery cabbage)	1.16	.05	2.5	15
Turnips, Chinese, fresh	.63	.01	5.62	25
Mustard stalks, see below				
Cabbage	1.6	.3	5.6	32
Soy bean	36.71	17.43	24.93	403
Onions	1.6	.3	9.9	49
Sesame oil, approximate fig. by Mr. Cameron	----	90.0	----	810

Whereas there are no figures for Chinese Mant'ou and mustard stalks, figures for White bread and Cabbage might be used in their places, respectively.

Numerous samples of these foods were selected and carefully analyzed.

Here are the percentage proportions of calcium and phosphorus in the food given :—

TABLE IX.

	Wheat Flour	Millet	Bean Flour	Garlic	Cabbage	Mustard	Salt Turnip or Radish
Calcium %	0.07415	0.07664	0.10705	0.042	0.03525	0.1896	0.1214
Phosphorus %	0.3295	0.3349	0.3828	0.02024	0.0431	0.0386	0.060

In Table X. we see the amount consumed by each patient in seven days, with the total phosphorus and calcium content of the same :—

TABLE X.

Patient	Wheat Flour	Millet	Bean Flour	Cabbage	Garlic	Mustard Leaves	Salt Turnip	Total Ca.	Total P.
1	2681	350	210	1190	110	280	70	3.5630	11.4857
2	2331	350	140	1190	110	280	70	3.2285	10.0657
3	2681	350	210	1190	110	280	70	3.5630	11.4857
4	2331	350	140	1190	110	280	70	3.2285	10.0657

Shohl and Sato estimate that the daily calcium requirement of the average person *per* kilogram of weight is 0.0152 gm. in order that he may remain in a state of calcium balance. Ehrstrom considers that the minimum phosphorus pentoxide required by an individual is 0.06 gm. of P_2O_5 *per* kilo daily, or 0.0261 gm. of phosphorus *per* kilo daily. Based on these figures Table XI. presents the daily consumption of calcium and phosphorus in grams, and also the quantities of both required daily by the patients according to their respective weights. The diet as given, though undoubtedly more liberal than their home diet, is still deficient in calcium, though adequate in phosphorus.

TABLE XI.

Patient	Intake of Calcium per day	Daily required Calcium.	Daily Diet balance Calcium	Intake of Phosphorus per day	Daily required Phosphorus	Daily Diet balance Phosphorus
1	0.5090	0.53244	minus 0.0234	1.6408	0.9282	Plus .7126
2	0.4612	0.4758	minus 0.0146	1.4365	0.8117	" 0.6248
3	0.5090	0.6548	minus 0.1458	1.6408	1.1170	" 0.5238
4	0.4612	0.4666	minus 0.0054	1.4365	0.7960	" 0.6405

The fæces and urine were very carefully collected, weighed and analyzed. The results are shown in the following tables:—

TABLE XII.

Patient	Total Ca. in gm. urine 7 days	Total P. in gm. urine 7 days
1	1.6351	2.8598
2	0.2634	1.9879
3	0.3467	3.2646
4	0.6606	2.7657

TABLE XIII.

Patient	Total Ca in gm. faeces 7 days	Total P in gm. faeces 7 days
1	2.4213	5.7847
2	3.0145	4.4503
3	2.7761	5.7758
4	3.4104	5.7543

Having estimated these figures, a table was drawn up which represents the position of the patients as regards the calcium and phosphorus balance.

TABLE XIV.

		Calcium in grams		Phosphorus in grams		
Patient	Intake	Excretion	Bal. 7 days	Intake	Excretion	Bal. 7 days
1	3.5630	4.0564	Minus 0.4934	11.4857	8.6445	Plus 2.8412
2	3.2285	3.2779	Minus 0.0494	10.0657	6.4382	Plus 3.6275
3	3.5630	3.1228	Plus 0.4402	11.4857	9.0404	Plus 2.4453
4	3.2285	4.0710	Minus 0.8425	10.0657	8.5200	Plus 1.5457

To complete the series the blood calcium was also estimated and the result is shown in Table XV.

TABLE XV.

Patient	Calcium in mg. per 100 cc. serum	Phosphorus in mg. per 100 cc. plasma
1	7.503	1.83
2	6.395	1.24
3	6.175	2.42
4	5.810	1.55

It thus was evident that three out of four of the patients were in a condition of negative calcium balance, whilst all had a positive phosphorus balance.

Is the negative calcium balance merely the expression of a calcium deficiency in the diet, or is it that the diet lacks some element which acts as an activator in the retention of calcium?

It will be noted that patient 3 had a positive calcium balance. She was an old patient of the hospital and had received two short courses of treatment with cod liver oil and calcium phosphate, the last of which was in the fall of 1923, about four or five months before this experiment was begun. She was so much improved that she asked to come into the hospital on the "metabolism squad." Physically, she was the most active of the four patients. Tso has observed in rickets that, even after a short course of treatment by cod liver oil, the X-ray shows bone development proceeding for as much as two or more months after cod liver oil has been discontinued. This probably accounts for the behaviour of this patient in regard to her calcium balance.

Having thus determined the actual condition of affairs the patients were put on treatment as follows:—

1. Cod liver oil 8 cc. three times a day. Same diet. (See Table VII.)
2. Cod liver oil 8 cc. three times a day and 1 gramme calcium lactate. Same diet.
3. Cod liver oil 8 cc. three times a day and 1 gramme calcium phosphate. Same diet.
4. Olive oil 8 cc. three times a day and 1 gramme calcium lactate. Same diet.

The results are shown in the following table:—

TABLE XVI.

Patient	Total Calcium in gm. ingested - 7 days	Total Phosphorus in gm. ingested - 7 days
1	3.5811	11.4983
2	4.4083	10.0783
3	5.4881	12.3195
4	4.4083	10.0783

The excretion in urine and fæces is shown in the next tables:-

TABLE XVII.

Patient	Total Ca. in gm. Urine - 7 days	Total P. in gm. Urine - 7 days
1	1.4034	2.8440
2	.8276	2.0445
3	.4157	2.9627
4	.6638	2.5875

TABLE XVIII.

Patient	Total Ca. in gm. Faeces - 7 days	Total P. in gm. Faeces - 7 days
1	1.9801	5.6582
2	1.9445	2.6911
3	1.7854	3.2528
4	4.2530	4.5855

Taking these results, the position of the patients as regards the calcium and phosphorus balance was again estimated:—

TABLE XIX.

		Calcium in gm.		Phosphorus in gm.		
Patient	Intake	Excretion	Bal. 7 days	Intake	Excretion	Bal. 7 days
1	3.5811	3.3836	Plus .1976	11.4983	8.5022	Plus 2.9961
2	4.4083	3.7712	Plus 1.6371	10.0783	4.7356	Plus 5.3427
3	5.4881	2.2011	Plus 3.2870	12.3195	6.2155	Plus 6.1040
4	4.4083	4.9168	Minus .5085	10.0783	7.1730	Plus 2.9053

The blood calcium and phosphorus results at the end of seven days are given in Table XX.

TABLE XX.

Patient	Calcium in mg. per 100 cc. serum	Phosphorus in mg. per 100 cc. plasma
1	8.62	1.83
2	8.197	2.10
3	9.57	3.02
4	8.58	1.64

Discussion.

For the sake of clearness the cases will be taken up in order, and the results of the two experiments will be compared.

Patient No. 1.—On an identical diet with that used in Experiment 1, which was deficient in calcium; but with the addition of cod liver oil; her calcium balance changed from a negative to a positive one and her blood calcium from 7.503 mg. to 8.62 mg. per 100 cc. serum. The weekly calcium output in the urine was very high in both experiments, but in the second the output in the urine and fæces was less than in the first experiment, which

accounts for the change in the balance and for the increase in calcium in the blood. The change in the phosphorus balance was very slight, and there was no change in the blood phosphorus. It would seem from this experiment that there must be in the cod liver oil some element which in osteomalacia will materially influence the retention of calcium in the system even in the presence of a deficiency in the food. Clinically, she was greatly improved. On admission she would not leave the bed, and sat with her head supported on a Chinese pillow about which she held her arms, but at the end of the second experiment she was voluntarily leaving the bed for a chair, and would walk the length of the ward, though it was slow work.

Patient 2.—With the standard diet and cod liver oil and calcium lactate added, the calcium balance changed from a slightly negative to a marked positive. The calcium in the urine increased in the second experiment, but in the fæces there was a decrease as compared with the first experiment. The blood calcium changed from 6.295 mg. to 8.97 mg. The phosphorus balance was more strongly positive than in the first experiment, and the blood phosphorus increased from 1.24 mg. to 2.10 mg. She was clinically much improved.

Patient 3.—Calcium phosphate and cod liver oil added to the diet made even more marked changes. The calcium balance changed from plus .4402 gm. to plus 3.2870 gm., and the phosphorus from plus 2.4453 gm. to plus 6.1040 gm., and the blood calcium and phosphorus were profoundly affected. The calcium phosphate containing more calcium in the molecule than the lactate, she got a correspondingly greater amount of calcium, and it also contains the phosphorus. In this case again we found the calcium in the urine increased and in the fæces decreased in the second experiment. In these two cases we see a magnification of the effect of some element in the cod liver oil observed in Case 1. In both cases we now have no deficiency of calcium in the diet, and the activator enables the patient to utilize and retain larger amounts of calcium than in the first case. The retention of the calcium calls for a corresponding retention of phosphorus which we find in the increase in the balance ratio and also in the blood.

Patient 4.—This patient was given, in addition to the regular diet, olive oil 8 cc. and 1 gm. of calcium lactate daily. The olive oil was given because the other patients were getting oil and we did not want this patient to feel that she was treated differently from the others, also from numerous other experiments we felt that over so short a period the olive oil would probably produce no effect on the calcium metabolism. We found that her calcium balance remained negative, though to a less degree in the second

experiment than in the first; the calcium excretion in the urine remained almost stationary, with a big increase in the calcium excreted in the fæces, a reversal of the condition in the others. The blood calcium was increased almost in proportion to the others. This must mean that the calcium is absorbed from the intestine and goes to increase the blood calcium, but unless utilized in the tissues is returned to the digestive tract and is excreted. The change in the balance of calcium and the increase in blood calcium are probably due to temporary storage of calcium in the blood and not to metabolized calcium. The blood phosphorus remained practically stationary, with a small change in the total phosphorus balance. Clinically she did not improve and complained that the other women wished to move a little while she did not.

Taken together we see that in these patients with osteomalacia there was a deficiency of calcium in their diet. This may have an effect in producing the disease, but there is another deficiency in their diet which is of greater importance than the calcium, namely, the vitamine content, whether "A" or "X," which is found in cod liver oil and other animal fats. Increasing the calcium in the diet of Case 4 did not clinically improve her condition and did not produce an absolute positive balance. Yet in Case 1 without an increase in the calcium and only the addition of the cod liver oil she improved clinically and also retained and utilized calcium. In Cases 2 and 3, with the two deficiencies in the diet made up by the addition of calcium salts and the cod liver oil, the changes were correspondingly marked.

Three facts at once became clear:—

(1) These women are living on the edge of a calcium starvation diet, and probably in the circumstances prevailing in their own homes are at times actually calcium starved.

(2) Although the administration of vegetable oil with the diet in one case led to a rise in the blood calcium, it did not appear from the figures to be more than a piling of calcium into the blood to have it promptly cast off again, for the negative balance was not transformed into a positive balance.

(3) That the addition of an activator in the form of cod liver oil at once led not merely to a rise in the blood calcium but to the transforming of a negative balance into a positive one, showing that the calcium was not merely being carried into the body, but that the body was using the same for anabolic processes.

What is the process which is going on which in the absence of a sufficient activator leads to the calcium loss and the appearance of symptoms?

B. E. Read, of the Peking Union Medical College, has urged on us the view that for some reason or other, largely due to the

character of the food, the acid base equilibrium of the body is upset. These diets produce an acid ash, and this leads to the washing out, so to speak, of the body calcium, and instead of the calcium of the food being absorbed, the acids formed by this food combine with the calcium to form salts and are thus excreted. The final result is a calcium starvation plus a calcium drain, and this occurring in pregnancy, proves too much for the stability of the body supply, and leads to the bones being called on in an abnormal manner to supply the general deficiency.

Our own work does not tend to bear out this theory. In the first series of Miles' Shansi experiments the carbon dioxide combining power of the plasma does not seem to indicate a change in the acid-base equilibrium and the results do not indicate an acidosis.

E. W. H. Cruickshank, of the Peking Union Medical College, in a personal communication, says :—

"It is a very difficult thing to alter the acid-base balance, so difficult in fact that in acute tetany with alkalosis due to a marked CO_2 deficit, the alteration in pH may vary by only 0.15 to 0.20, and this variation is quite within physiological limits.

The idea of the acid ash denoting an acid diet, acid enough to upset the buffer action of such a physico-chemical system as blood, needs to be viewed with caution.

The question of what leads to a washing-out of body calcium is a very complicated one. It depends upon the form in which calcium is most easily excreted by the bowel and kidneys. Is that form a salt or an ion? There is a distinct relationship in an *in vitro* mixture between Ca^{++} HCO_3^- and H^+. If the formula of Rona Takahashi holds in blood, then any increase in H ion concentration will favour the increase in Ca ions and Ca ions can readily get out by the kidney, and this is favoured by lack of parathyroid or protein poisons. What part, if any, does fat soluble vitamine play in controlling the amount of Ca ions, which may be liberated from or taken up by protein or salts? H ion concentration plays a part, we are sure, in controlling the union of Ca with protein of tissue just as it plays a part in controlling the union of Hb with K and with O_2. But with a process of metabolism; to say that is only one step nearer home, in that it gives an inkling to the part a vitamine may play. And as Mellanby suggests, high protein foods may be playing a part antagonistic to the normal anabolic processes.

As far as the work we have done goes, it tends to show that parathyroid lack alters the balance between ionic and colloidal calcium. Most of the Ca goes to the ionic form and with that change there is a change in pH to acid side of neutrality, and here one is back to the experimental *in vivo* proof of the *in vitro*

relationship between H ion, Ca ion and HCO_3 ion. It may be that parathyroid extract is the correct key for the treatment of the tetany of Ca breakdown; whilst a supply of fat soluble vitamine is the key for the treatment of the osteomalacic disaster; if so, the pathological change in protein chemistry is different, though not necessarily essentially so."

These ideas naturally lead on to the consideration of two questions, neither of which we are able to answer definitely, but both of which deserve careful consideration.

Is the setting up of a process of this kind, if it really occurs, due to the protein of this ill-balanced diet? Mellanby has brought forward evidence to prove that cereals in a diet which is deficient in fat vitamine tend to produce defective bone calcification, and apparently it is the protein element, which is the responsible factor. Moreover, a diet of this kind in puppies tends to produce muscle changes and weakness of locomotion. In the osteomalacia cases in goats, which I shall mention later on, there was undoubtedly overfeeding with beans, which contain a high protein factor.

Is there a definite shortage of fat soluble vitamine in these diets? There is undoubtedly in the Shansi cases (especially at times) a very poor supply of green vegetables, which is the main source of their fat soluble vitamine in the absence of milk, butter, eggs and animal fat. That there is not a gross shortage is pretty certain, as, in spite of careful inquiries, we have not been able to trace any cases of zerophthalmia, but the rapid improvement which takes place on the administration of cod liver oil proves that there must be a shortage in this direction granting that the activator is really fat soluble vitamine, and not a special substance found *par excellence* in cod liver oil.

How does this activator act?

There is no doubt that fats play a large part in the transference of mineral salts from the bowel to the blood, but, as we have already said, vegetable fats will do this to a sufficient extent and yet fail to meet the situation. Vines and Cruickshank have brought forward evidence to prove that the parathyroid gland has a profound influence on calcium metabolism in the body, and Erdheim has reported pathological changes in this gland in five out of six cases of osteomalacia, but it is not clear that these changes may not be the effect of the osteomalacia rather than its cause; and although our experience so far with the administration of the commercial gland-products has been small, we have seen no results which would justify our saying that the administration of this gland plus cod liver oil is more efficacious in the cure of the disease than cod liver oil alone.

We think there is little doubt that infections added to the

disease aid its progress. In our sole case of osteomalacia in the male, the process apparently started at the age of 12, as a sequel to an attack of measles, combined with close confinement to a dark room for many weeks; and thereafter there was an intensification of this treatment—*i.e.*, confinement to a dark room and bed, due to the pain accompanying the onset of the disease and sepsis due to bed-sores. But we have no evidence which would justify our placing this disease in the category of microbic infection. The work of Montpurgo and others in Italy, and Mossu and Charrin in France, as to a definite infective agent which is transmittable, needs confirmation, and is doubtful in view of the other facts which we know about the disease.

What influence has the environment factor on the genesis and progress of the disease?

In Shansi, where the disease is most prevalent, the "Kangs" are heated by coal, the fumes to a considerable extent escaping into the room, and this means pollution of the atmosphere. Cases of carbon-monoxide poisoning are not by any means unknown. Next there is the evil influence of foot-binding, in retarding health and preventing movement. Following this one has the fact that these cases are mostly occurring on the uplands, where the winters are severe and confinement to the house, especially in the case of women, is almost complete. And in considering the movement factor one has to note the significant fact that osteomalacia is a disease of the middle classes. The poor, who are compelled to get out and work in the fields, rarely get it. The rich, who have plenty of nourishing food, with meat and fat, are seldom affected. The victims are what we might almost call the genteel members of Society; too proud to work, even if their families would allow it, not rich enough to afford the meat and fat which would correct the deficiency in other ways.

As was mentioned earlier on in this paper, after the close of Miles' Shansi experiments, we received the paper on two cases of infantile tetany which had come into the medical wards of the Peking Union Medical College. Looking at the blood estimations it was clear that we had here a parallel case to our Shansi work. If this was correct these girls ought to have signs of commencing osteomalacia. They were fetched back to hospital and re-examined with the result that both of them showed signs of the disease.

It is interesting to note a few facts about this Orphanage. It contains about 50 girls and 70 boys from 10—18 years of age. No boys presented signs of tetany, but of the girls, who remained mostly indoors during the winter months, there were no fewer than 10 who complained of "ma mu," and some had facial phenomena showing that they had either had tetany or were on the verge of it.

The diet at this Orphanage is as follows:—

Breakfast: Millet gruel, corn bread, salted carrot.
Lunch: Wheat bread, vegetable.
Supper: Corn bread, vegetable, salted carrot.
Meat once a month.

Vegetables are as follows, according to the season:—

Cabbage—October to January.
Bean sprouts—February.
Onion and bean curd—March.
Spinach—April.
Egg plant and gourd—May to August.
Pearl melon—August to September.

It also has to be borne in mind that children have their likes and dislikes, and will pick and choose their food, thus possibly helping on a diet deficiency trouble.

Finally, there is the question of sunlight. Some of the small courts get little, and if the woman stays on the "Kang" (and she tends to stay there more and more after the pains of the disease come on) she gets very little sunshine. So that, taken altogether, the environment certainly aids the disease.

As bearing on the general question of the ætiology of this disease, it must also be borne in mind, *first*, that it is extremely rare when an adequate diet is in vogue among any people, and *second*, that an improvement in diet will lead to its speedy disappearance from places where it has formerly been rife.

Whether there is any racial tendency to the disease is doubtful. We have quoted one case in which an Australian woman living under Chinese conditions contracted the disease.

Irving has also personally pointed out to one of us that only three cases of the disease have been diagnosed at the Lying-in-Hospital in the Harvard Medical School during the past ninety years. Strangely all these cases occurred in Syrians, but it is known that in the case which was most carefully studied, the diet was extremely poor, almost a starvation diet.

Our own conclusions as to the ætiology of the disease are as follows:—

Osteomalacia is a diet deficiency disease and is to be placed in the same category as rickets.

The deficiency is principally in the fat soluble vitamine or calcium activator content of the diet, though there may be and probably is an actual or at least a proportional calcium deficiency at the same time.

The result of this deficiency diet is that a disturbance of the normal calcium metabolism is set up, and it is possible that in

addition to the diet deficiency there is a toxic process set up by an unbalanced protein consumption (cereal).

Intercurrent septic affections will aid in the progress of the disease, but probably only by lowering the general vitality, and there is no evidence of such infection in the majority of cases.

The evidence suggesting diseased processes in the ovaries and parathyroid is insufficient to place the blame for the disease on either organ.

Osteomalacia may be prevented by improving the diet of the population in the direction of a fuller supply of fat soluble vitamine and salts. It may be cured by providing a sufficiency of food plus a calcium activator such as cod liver oil and sunlight.

Section V.

The Sequelæ of Osteomalacia.

The sequelæ of osteomalacia may be divided into those which affect labour, and those affecting marital relations.

The sequelæ affecting labour have long been known. In fact, wherever there is a hospital in a region in which osteomalacia occurs, the measure of the severity of the disease is indicated by the number of Cæsarean sections. I have no records of any patient in China coming to hospital in whom the pelvis was soft so that it could be opened with the hand. As a rule, it has been a question of craniotomy (if it could be done), or Cæsarean section; and in both the mortality rate for the mother has been very heavy owing to the fact that these cases come in after one, two, three, four, five, or six days' labour, most of them already septic, and often with the vagina seriously damaged and infected.

The native midwives have no idea of how to deal with these patients. They take either a meat-hook and conceal it in their hand, binding it to the wrist; or they take a pair of charcoal tongs and bend over one of the points to form a rough hook. The hand with the hook of the modified tongs is then introduced into the vagina, and anything that can be caught and torn away suffers this fate. Naturally, they produce the most terrible injuries to the bladder, bowel and vagina. I know of one case in which the uterine wall was torn and part of the maternal bowel dragged down and torn out; and I know of more than one case which has entered hospital with the uterus ruptured, whilst vesico-vaginal fistulæ are common in the few cases that survive this sort of manipulation.

What is the best treatment for cases with contraction due to osteomalacia? If the contraction is at all severe, provided the patient is seen before labour or early in labour, Cæsarean section with tying of the Fallopian tubes to prevent a further pregnancy is

the method of choice unless the patient wishes to have another child. Unless the case is a really severe one, it is quite safe for her under appropriate treatment to risk another pregnancy without fear of the disease becoming again active.

The best method of dealing with the Fallopian tubes is the following: Double ligature the tube about one inch away from the uterine cornu. Divide between the ligature; with the points of a pair of fine pressure forceps make a small tunnel on the back or front of the uterus, as is most convenient, under the peritoneum. Draw the uterine end of the tube into the tunnel, and fix it there by a fine stitch. This is easily done, and makes a further pregnancy impossible. The question of the method of Cæsarean section which should be used in these cases is not fixed, probably a two-flap extra-peritoneal section is the best.

In the very neglected cases there is no doubt that the safest method is a Cæsarean hysterectomy.

Should the contraction be a moderate one and the child be dead, a craniotomy should be done, and a Cæsarean section planned for the next occasion.

As to the anæsthetic to be used, chloroform is very dangerous in these neglected cases. Ether should be used. Open ether with a preliminary injection of atropine 1/200 grain (no morphine) is the best form of exhibiting the anæsthetic.

With regard to the question of marital relations, in quite a number of cases the tubera ischii become almost apposed, so that one cannot get a finger between them. Then the inclination of the pubes becomes altered, and the descending rami of the pubes and ascending rami of the ischia are approximated so that coition becomes impossible. When there are several wives this is not a matter of such importance, but when the patient is the only one, the result may be a most miserable home. The following case may serve as an illustration.

Case No. 3062. Lo Yin Shih, aged 26; from Shou Yang, Shansi, came into the Peking Medical College Hospital on September 5th, 1922. Patient was married at 16 years of age. When she was twenty years old her first child was born naturally; it died when 3 years old. A year later her second child was born naturally, and it died when 3 years old. In the case of both these children the cause of death was unknown.

The third child was born when she was 23 years old and died the day after birth, labour being very difficult. After that time marital relations became increasingly difficult till at last they were impossible. Her husband sold her off to a second man, who finding coition impossible was preparing to sell her to a third. She threatened to commit suicide if nothing could be done for her.

Dr. F. J. Wampler of Pingtingchow kindly sent her in to me (Maxwell).

Patient's height was 4 feet 10 inches. Weight 92 lbs. Pelvic measurements as follows; spines 21 cm.; crests 23.25; trochanters 22.5 cm.; ext. conjugate 17.5 cm.; interischial 2.0 cm.

A finger could be got into the vagina with difficulty before and behind the tubera ischii. Coition is manifestly impossible. The Wassermann reaction was negative and otherwise the patient was in good health.

Two courses were open: (1) to excise the descending ramus of the pubes, ascending ramus of the ischium, and part of the ischial tuberosity, on one or both sides; (2) to excise the coccyx, and try to make a vaginal opening posterior to the tubera ischii. In the former operation there was the possibility of disturbing the balance of the pelvis and weakening the adductor muscles of the thigh. In the latter operation although one might get a larger vaginal opening posterior to the tubera ischii, yet the direction of the vaginal canal would be displaced very seriously. It was decided to try the first course.

The X-ray report of the pelvis was as follows: "The bones are a little thinner than normal, and it is noteworthy that this thinning is at the expense of the material between the lines of cancellous tissue, so that the cancellous structure stands out very plainly against the darker background. The first portion of the sacrum is very prominent. The pelvis is contracted and the pubic bones project sharply forward so that the symphysis lies well anterior to the descending ramus of the pubes."

On September 14th, 1922, the patient was anæsthetized with ether and placed in the lithotomy position. The site of the operation had been thoroughly painted on the previous evening with brilliant green and crystal violet paint, and a fresh coating was given when she was on the table.

The vulval aperture and the anus were both closed by fine silk. An incision extending from the pubes to below the ischial tuberosity and about four inches long was made about two inches outside the vulval aperture on the left side. The tissues were divided down to the bone, and a superiosteal resection of the descending ramus of the pubes and the ascending ramus of the ischium and half of the ischial tuberosity was made, bleeding points being carefully secured as cut. There was comparatively little bleeding. The vagina was not opened. Care was taken not to interfere with muscular attachments more than was absolutely necessary, and the wound was sewn up with fine silk, bringing the tissues together in their various layers so as to leave no dead

space. After sealing the area round the wound with collodion and gauze, the vagina and anus were again opened.

The patient made a normal convalescence, and on discharge two fingers could be easily inserted into the vagina, and she had no difficulty in walking. She was seen about three months later. Locomotion was perfect, and it had been possible for her to resume marital relations without any pain or inconvenience.

The subsequent history of the case is very interesting. Within two months she became pregnant. Before operating on her, I had explained the situation very clearly, and she knew that a Cæsarean section was necessary. But coition had been so easy that her relatives, especially on the mother's side, refused to believe that labour could not be conducted in the ordinary way. In spite of my pleadings and protests they refused to send her to hospital, and it was only after she had been three days in labour that they brought her begging for assistance. She was taken to Pingtingchow Hospital under a heavy dose of morphia, the fœtal heart just audible and the uterus already in a state of tonic contraction. Dr. Wampler performed a Cæsarean section. The fœtus, a full time male, was dead, and the mother was desperately ill for 48 hours, but recovered after a smart attack of sepsis. The Fallopian tubes were tied, but the uterus was not removed.

As to the condition of the parts, the vagina admitted two fingers easily. There had formed a hard, irregular crescentic band with the concavity inwards in the situation where the bone had been removed. Locomotion was perfect and there was no instability of the pelvic girdle.

So that, as far as the final result was concerned, the operation had been a complete success; and there would have been but for the stupidity of the relatives, a living and perfect child. In the early months of pregnancy she had been treated with cod liver oil and calcium lactate, and there were no signs of recurring osteomalacia.

Section VI.

Treatment of Osteomalacia.

When the question of treatment is discussed one is confronted with two difficulties. The first is the lack of an accurate knowledge of the process whereby calcium is laid down and taken away from the bones, which, if we knew, might guide us to a rational treatment of the disease. At present one is like a person groping in the dark, seeking empirically for some key which will fit the lock. We also know that by giving cod liver oil, and possibly calcium and phosphorus in addition, we can quickly remove the symptoms of tetany accompanying the disease, and also

remove the worst of the pain. But even here we find that in what is apparently the same degree of severity, the recovery rate is very variable in its rapidity, and one sometimes seems to succeed up to a certain point, and then one's efforts apparently are fruitless for some time in securing a complete cure.

And one of the complicating features, and this makes up our second difficulty, is that the great mass of the population of North China are living, so to speak, on the edge of a precipice. We can safely say that the food ration of the majority of the people is deficient both as regards quantity and quality, especially the latter. If the standard of living as regards food and exercise could be raised, there is not a shadow of doubt in our mind that osteomalacia would become an insignificant problem. But what can be done, when in one of the best ruled provinces of China, with strict laws against foot-binding, the people refuse to give up this senseless and cruel custom. How can an improvement in the living standard be gained when no one, in view of the political unrest, durst invest capital in what would inevitably raise this standard? Flocks and herds, milk and meat, are wanted, and there is no reason why, given peace and justice and security of tenure, one should not be able to obtain these necessaries. The main treatment for osteomalacia is to secure such security of life and property that a higher standard of feeding and a more healthy standard of living may prevent its development.

In discussing this matter one cannot leave out the question of drought and famine. The whole of North China has been deforested, moreover Shansi lies on the edge of the dry belt and flood and drought follow one another with painful frequency. These questions are of national importance, and problems which can only be dealt with by the nation as a whole. If good roads were available so as to make the interchange of commodities more rapid and easy, we might get a sufficient improvement in living standards without the larger questions being solved, and probably the best way to tackle the question would be by road building.

As to the medicinal treatment of the individual case, we have found that cod liver oil in sufficient doses—and by this we mean at least one and a half ounces daily—combined with calcium lactate, 15 grains a day, is the most satisfactory method. Calcium phosphate does not seem to be as efficient. We have tried treatment with parathyroid gland as an additional help, but, as we have already said, without being convinced that it really helped in the progress of the case. Fresh air and sunlight should also be urged, and the patient made to sit out in the sun.

As far as possible the general diet standard must be improved,

so that the family understands the importance of the balancing of the various articles of food which it may be able to obtain.

In the case of future pregnancies the patient should be placed on cod liver oil and calcium at the beginning of the pregnancy, and this treatment kept up through pregnancy and lactation, care being also taken that the patient gets an improved and adequate diet.

Section VII.

Osteomalacia in Animals.

Does osteomalacia in the lower animals occur in China? It is known to occur in Europe, especially in France, where it is called "cachexie osseuse" or "maladie des pattes"; also in the United States, especially in Southern Alabama and in parts of Mississippi and Florida. In these places it occurs especially in oxen, cows, horses, sheep, goats, swine, dogs, rabbits and cats. It is supposed to be due to a diet which is deficient in calcium.

One set of cases in goats has come under my notice from a herd in Tung-hsien, Chihli, and another case has occurred in a group of goats in Peking itself. In the first set four kids, which were born in February, were fed with milk for three months; and were in good condition. They were covered by an error in July, and went into kid at once. They fed on alfalfa up to the end of October. At the same time they had a supply, twice daily, of equal parts of maize, black beans and wheat bran. From November onwards the food consisted of dry alfalfa, kaoliang leaves, sweet potato vines, leaves of poplar, willow and hwei shu in addition to the mixture just mentioned. The goats began to show signs of disease shortly after the beginning of November and dropped their kids two months later.

None fully recovered till after they dropped the kids, although they were improving under cod liver oil. Three were affected out of the four. Two made a perfect recovery with straightening of the limbs. One made a partial recovery, but was still improving a couple of months later. All were giving good milk at that time. They all have remained well and have gone through another pregnancy without a recurrence of the disease.

Now, in this case we not only have a diet which is possibly deficient in calcium and in the specific substance which is present in green leaves and cod liver oil, but the question of an unbalanced consumption of protein may also be responsible for the initiation of the disease. The special signs of disease were bowing of the legs, and X-rays showed there was a bending, an increased transparency and a slight blurring of the bony structure. There was no definite affection of the epiphyseal ends of the bones.

General Conclusions.

1. China is at present one of the world centres for the study of osteomalacia.
2. In the special area involved the incidence is from 1 to 3 per cent. of child-bearing women.
3. Whilst its effects are more often shown in pregnancy and the puerperium, it frequently begins about the time of puberty.
4. The disease is one due to a deficiency diet, the principal lack being in a shortage of mineral content and the activator for calcium metabolism.
5. Lack of sunlight and movement are contributing factors in its production.
6. The bones of full time fœtuses from mothers with osteomalacia do not show the signs of rickets, but of osteoporosis. There is, however, a little evidence to suggest that these infants develop rickets more easily than the normal child.
7. The sequelæ of the disease are two-fold—one, deformity of the pelvis, the results of which on labour may be counteracted by a planned Cæsarean section; two, interference with marital relations, which may be treated by a new operation in which portions of the pubes and ischium are resected.
8. The ovaries have nothing to do with the disease, and it is not necessary either to remove them or even to tie the Fallopian tubes, provided that the woman is treated with cod liver oil and calcium, and this treatment is kept up during any future pregnancy.
9. By improving the diet and supplying cod liver oil it should be possible in due time to stamp the disease out. Prevention is the principal thing, and to this end a settled government and improved means of communication are essential.
10. Animals also suffer from this disease, and can be cured by the administration of cod liver oil.

Fig. 2. Normal standing position of a patient with osteomalacia.

Fig. 3. Side view of severe case showing the sinking of the head into the chest, the curvature of the humerus and the deformity of the chest.

Fig. 4. Back view of the same case showing deformity of the spine.

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Fig. 5. View of a severe case showing marked deformity of the sternum.

Fig. 6. A case of osteomalacia in the male. Front view.

Fig. 7. A case of osteomalacia in the male. Back view.

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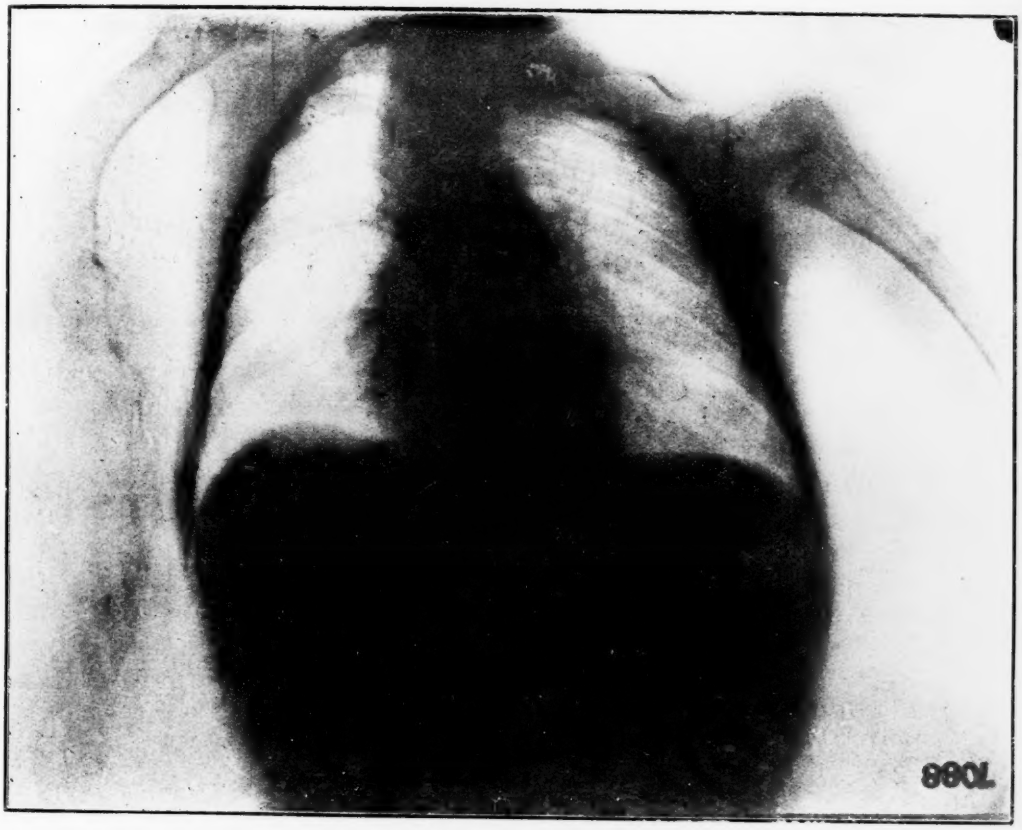

Fig. 8. X-ray of the chest from the case of osteomalacia in the male.

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Fig. 9. X-ray of femur from the case of osteomalacia in the male

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Fig. 10. Woman in labour seven days with obstruction due to osteomalacia. Note shortening of figure compared with husband (to the left), son and nurse (to the right).

Fig. 12. Women with osteomalacia with nurse outside the Pingtingchow Hospital. These were the women who came forward for the second portion of the experimental work.

Fig. 11. X-ray of pelvis of girl of 15 who came into hospital for tetany showing commencing deformity of pelvis due to osteomalacia.

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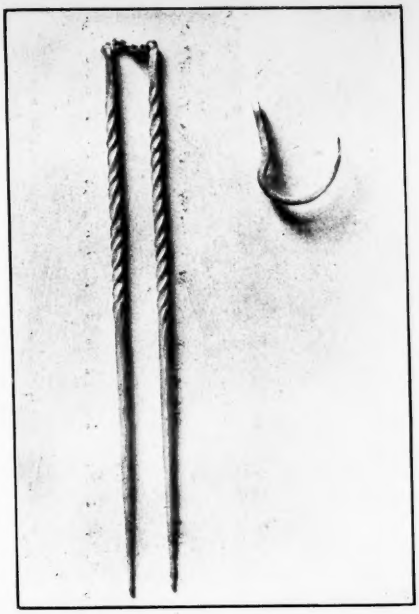

Fig. 13. Instruments used by Chinese midwives in attempting to bring about delivery in cases of labour obstructed by pelvic deformity due to osteomalacia.

Fig. 15. X-ray of pelvis of woman operated on for atresia of the vagina. Before operation.

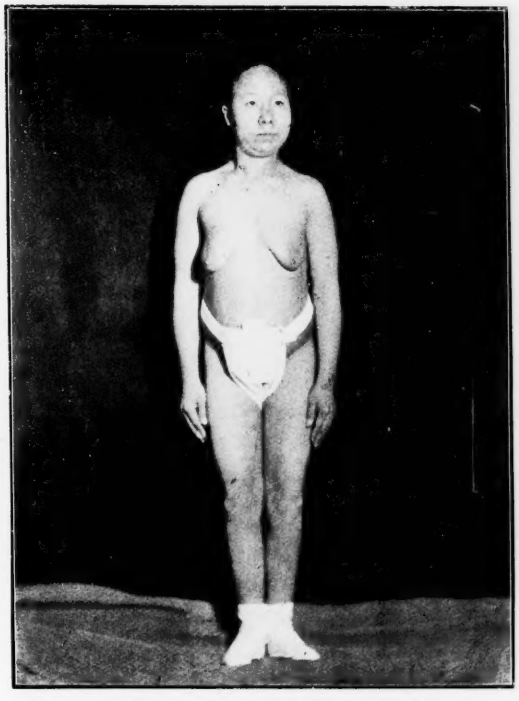

Fig. 14. Woman from Shouyang operated on for atresia of the vagina due to osteomalacia.

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Fig. 16. X-ray of pelvis of woman operated on for atresia of the vagina. After operation.

Fig. 17. X-ray of wrist of full-time fœtus from mother with osteomalacia showing cupping of the ulna.

Fig. 18. X-ray of wrist from a second full-time fœtus from mother with osteomalacia showing cupping of the ulna.

Fig. 19. End of ulna, on the left normal full-time fœtus, on the right full-time fœtus from a case of osteomalacia in the mother.

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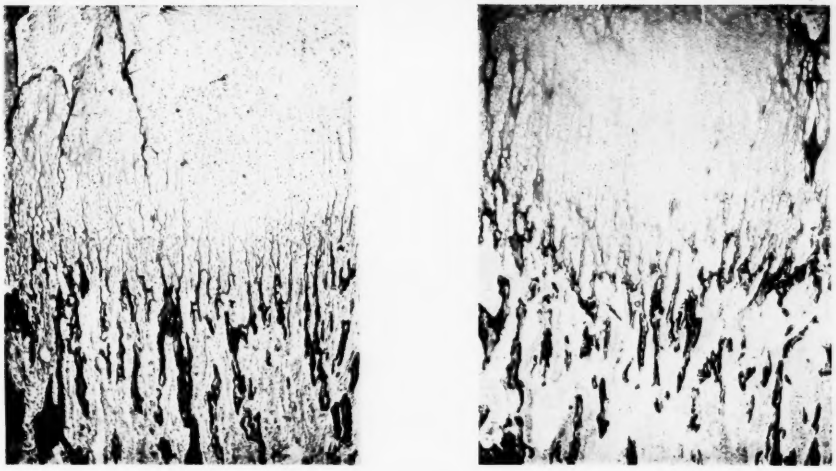

Fig. 20. Microscopical appearances. End of ulna, on the left normal full-time fœtus, on the right full-time fœtus from a case of osteomalacia in the mother.

Fig. 21. Osteomalacia in the goat.

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Notes on the Diagnosis of Syphilis as the Cause of Still-birth.

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THE presence of the spirochæta pallida in the fœtal tissues has been, is now, and always will be possibly, the only positive evidence of syphilis as the cause of still-birth.

The careful examination of those tissues for spirochætæ is, therefore, the method of choice in arriving at a diagnosis. There is no doubt, however, that many still-born children owe their death to syphilis although spirochætes are not found in their tissues. It may be that the spirochæte is present in such small numbers that it escapes observation, it may be present in some other form, or death may have been caused solely by the absorption of syphilitic "toxin" from the placental blood.

Whatever is the explanation, there are cases in which both the clinical and pathological evidence carry conviction that the fœtus should be diagnosed as syphilitic though spirochæte free.

It is naturally highly desirable that every case of syphilitic abortion or still-birth should be recognized so that a repetition of the calamity may be prevented by treatment of the mother or mother and father.

It is with this end in view that we have carried out the present investigation as an attempt to arrive at a criterion of diagnosis, either in the absence of spirochætes after microscopical examination of the tissues or even without microscopy when it is not available.

A series of proven syphilitic cases, spirochætæ present, has been taken and compared with a series in which, as far as is possible to say, there was no suspicion of syphilis, and in which there was other ample and obvious cause of death.

The second series comprises such causes as difficult labour, placenta prævia, accidental hæmorrhage, and the like; these cases are hereafter referred to as "Traumatic." There are 23 cases in the syphilitic series, 66 in the traumatic.

External Appearance.

Maceration was present to a marked degree in every case in the syphilitic series—100 per cent.

In the traumatic cases maceration was noted in 18 cases out of 66—27.3 per cent. In five of these maceration was very slight, thus definite maceration was present in only 13—19.7 per cent.

In addition to superficial skin sloughs the syphilitic fœtuses showed a general shrinkage of the tissues; the skin was thus loose and deeply puckered except over the abdomen, which was often distended by fluid.

Age at Birth.

This is best shown by a table.

	Traumatic.	Syphilitic.
9 months	43 = 65.1 per cent. ...	3 = 13 per cent.
8 „	9 = 13.6 „ ...	9 = 39 „
7 „	7 = 10.6 „ ...	5 = 21.75 „
6 „	6 = 9.0 „ ...	4 = 17.75 „
5 „	5 = 1.5 „ ...	2 = 8.8 „

Thus the syphilitic fœtus rarely survives to full time, whereas the healthy fœtus who is the victim of accident usually does so.

Weight and Length of Fœtus.

In this table the weights and lengths of "traumatic" and syphilitic fœtuses of different ages are shown. The traumatic cases are divided into "fresh" and macerated, as it was thought that maceration apart from syphilis might affect the weight.

	Traumatic.				Syphilitic.	
	Fresh.		Macerated.			
Age. Mths.	Weight. Grammes.	Length. Cms.	Weight. Grammes.	Length. Cms.	Weight. Grammes.	Length. Cms.
9	2900	50	2080	60	2065	44
	3370	50	2840	56	2400	44
	2670	50	2360	48	2470	46
	3000	51	3000	50	—	—
	2200	46	3900	53	—	—
	2400	46	3100	46	—	—
	3200	52	3040	48	—	—
	3970	53	3900	49	—	—
	3300	50	—	—	—	—

	Traumatic.				Syphilitic.	
	Fresh.		Macerated.			
Age. Mths.	Weight. Grammes.	Length. Cms.	Weight. Grammes.	Length. Cms.	Weight. Grammes.	Length. Cms.
8	1800	43	1480	44	2100	43
	2500	47	1500	40	1490	40
	1420	40	1890	44	2050	44
	2650	46	—	—	1580	44
	1740	45	—	—	1850	40
	1970	45	—	—	1649	32
	—	—	—	—	2200	44
	—	—	—	—	1090	27
	—	—	—	—	2170	46
7	990	27	1740	40	1240	40
	1400	42	1300	42	1800	40
	—	—	1550	42	1500	40
	—	—	1740	42	1630	39
	—	—	1580	45	1360	41
6	1155	36	500	30	705	31
	750	37	990	37	850	35
	—	—	1255	40	890	24
	—	—	1070	36	—	—
5	520	27	—	—	1500	34
	—	—	—	—	545	37

Examination of this table shows that there is no marked or constant variation in the weights or lengths in the three groups at any particular age. Every group shows considerable variation between highest and lowest and a determination of an average would be misleading.

Weights of Various Organs.

These have in all cases been calculated as a percentage of the total body weight. It would obviously be useless to compare the absolute weight of an organ in a child of 3,900 gms. with the corresponding organ in a child of 2065 gms., to take one example from the full time cases.

The three groups of traumatic "fresh," traumatic "macerated," and "syphilitic" have been employed again.

LIVERS—*Weights as percentage of body weight.*

Age: Months.	Traumatic, Fresh.	Traumatic, Macerated.	Syphilitic.
9	5.0	3.0	4.1
	4.6	2.5	4.3
	4.0	4.1	3.5
	5.0	3.0	—
	6.0	4.3	—
	6.4	5.6	—
	4.1	2.7	—
	3.3	3.7	
	4.0	4.2	—
	6.0	2.4	—
8	4.0	3.0	4.3
	5.5	2.8	6.3
	4.0	3.2	6.4
	4.8	4.0	5.0
	6.0	—	6.0
	5.7	—	8.8
	—	—	6.3
	—	—	4.4
7	5.2	2.4	6.5
	4.0	3.3	6.3
	—	4.5	3.0
	—	3.8	4.7
	—	3.0	5.3
	—	2.0	—
6	10.0	2.0	6.0
	5.0	5.5	3.8
	—	3.0	5.4
	—	2.1	5.3
5	5.0	—	5.6
	—	—	3.8

Taking an average of these cases the following results are found :—

Age. Months.	Traumatic Fresh.	Traumatic Macerated.	Syphilitic.
9	4·75	3·55	3·9
8	5·0	3·25	6·5
7	4·6	3·2	5·1
6	7·5	3·15	5·1
5	5·0	—	4·7

The only point to be noted here is, that taking the macerated cases alone, the figure is uniformly higher in the syphilitic cases. This is well shown in the sixth, seventh, and eighth month groups, in which there are most cases and therefore a truer average.

The " fresh " traumatic cases show a rather wide variation, and in this connection it must be remembered that in a large proportion of traumatic cases there is considerable congestion of the liver which would naturally raise its relative weight.

SPLEENS—*Weight as percentage of body weight.*

Age : Months.	Traumatic, Fresh.	Traumatic, Macerated.	Syphilitic.
9	.2	.2	.6
	·35	·14	·56
	.26	·35	·54
	.23	·32	—
	.23	.25	—
	·3	.16	—
	.2	·3	—
	.26	·3	—
	.25	·14	—
	.26	.2	—
8	·4	.26	.6
	·42	·3	.8
	·5	·44	·76
	·4	.2	.88
	.23	—	·54
	·44	—	·98
	—	—	1.3
	—	—	1.3
	—	—	1.35

Age: Months.	Traumatic, Fresh.	Traumatic, Macerated.	Syphilitic.
7	.15	.14	.8
	.27	.2	.53
	—	.48	.48
	—	.38	.47
	—	.24	.4
	—	.23	—
6	.24	.07	.8
	.1	.2	.47
	—	.15	.8
	—	.1	.4
5	.2	—	.86
	—	—	.55

These figures are very striking. It will be seen that in every group and in almost every case the figure for the syphilitic spleen is no less than double that for the traumatic spleen.

Too much stress must not be laid on averages in dealing with small numbers, but for the sake of interest they are here shown.

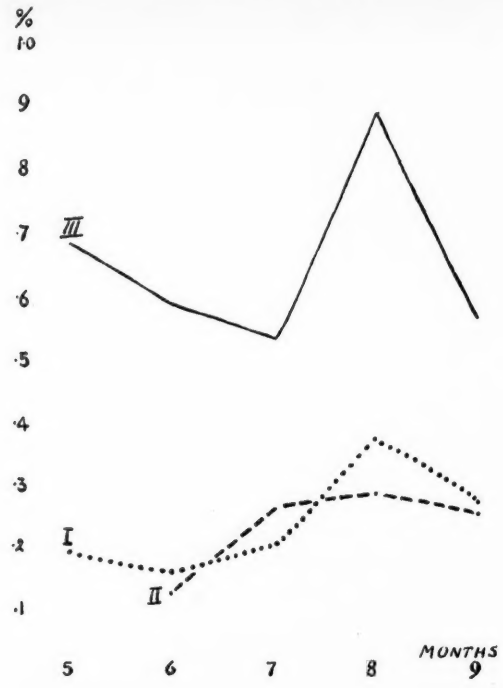
Average weights of spleens as percentage of body weight.

Age: Months.	Traumatic, Fresh.	Traumatic, Macerated.	Syphilitic.
9	.24	.23	.57
8	.4	.3	.9
7	.21	.28	.56
6	.17	.13	.62
5	.2	—	.7

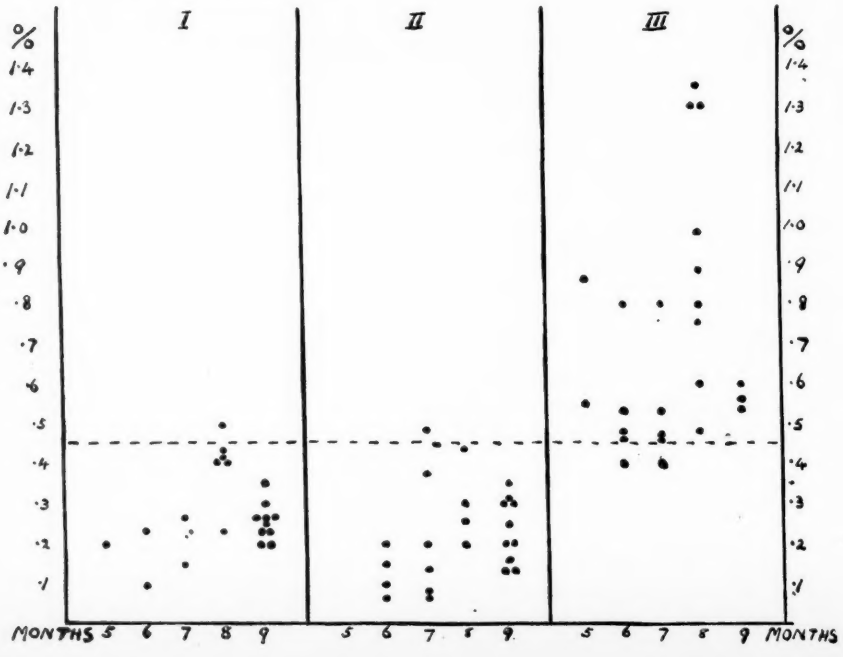
In the graphs below the variations in splenic weight are shown both as individual cases and as averages.

It appears from these results that the border-line weight is .45 per cent. Of 23 syphilitic cases two are just below the figure, while of 45 traumatic cases two are just above it.

GRAPH NO. 1.—Shewing average weight of spleen in syphilitic and traumatic cases at different ages. I = Traumatic—fresh. II = Traumatic—macerated. III = Syphilitic.



GRAPH NO. 2.—Shewing weights of individual spleens at different ages.—I = Traumatic—fresh. II = Traumatic—macerated. III = Syphilitic.



Kidneys. The percentage weight of the two kidneys together has been calculated.

Age : Months.	Traumatic, Fresh.	Traumatic, Macerated.	Syphilitic.
9	·75	1.1	·9
	·7	.88	.8
	·7	.8	—
	.66	·75	—
	.8	·9	—
	1.1	·7	—
	1.0	.6	—
	1.0	—	—
	·56	—	—
8	.81	1.2	1.1
	·7	.8	1.3
	·9	.6	1.0
	.8	—	1.6
	—	—	.6
7	1.5	·7	1.0
	.85	·76	1.0
	—	·9	·4
	—	1.0	.85
	—	—	.8
6	1.0	·9	1.1
	1.2	.85	1.0
	—	.6	—
5	1.0	—	1.5
	—	—	·75

Average figures are shown below :—

Age : Months.	Traumatic, Fresh.	Traumatic, Macerated.	Syphilitic.
9	.81	.82	.85
8	.8	.8	1.1
7	1.2	.84	.8
6	1.1	·78	1.05
5	1.0	—	1.1

It is seen from the above table that there is no variation in the proportional weight of kidney tissue in the three classes.

Placenta.

With regard to the weight of the placenta it cannot be assumed that this should bear any definite relation to the weight of the child, as is the case with its own organs. Possibly it should bear some relation to the mother's size and weight, but of these no data are available.

In the following table the figures are: 1. Absolute weights; and 2. Percentage of child's weight.

Age: Months.	Traumatic, Fresh.		Traumatic, Macerated.		Syphilitic.	
	1	2	1	2	1	2
9	555	14	327	15.0	480	23.2
	400	15.5	360	13.0	560	23.5
	525	17.5	725	15.0	690	24.0
	370	12.5	230	10.0	—	
	480	20.0	500	17.0	—	
	580	18.0	—		—	
	590	24.0	—		—	
	720	16.0	—		—	
	450	11.0	—		—	
	520	16.0	—		—	
8	330	18.0	350	23.0	680	32.0
	470	33.0	520	34.0	380	25.5
	340	20.0	—		400	25.0
	—		—		655	30.0
	—		—		490	22.5
7	310	21.0	355	21 0	482	39.0
	—		350	22.0	430	24.0
	—		170	13.0	590	43.0
	—		290	18.5	—	
6	280	24.0	122	24.0	245	29.0
	290	38.5	300	30.0	160	18.0
	—		210	17.5	—	
	—		180	17.5	—	
5	320	61.0	245	54.0	185	33.5
	—		—		360	40.0

It is apparent from these figures that there is great variation in the absolute weight and also in the weight compared to the

weight of the child. There is no indication that the syphilitic placenta is either larger or smaller than the normal either absolutely or proportionally.

" Chrondro-epiphysitis."

This change is found in the long bones at the junction of the diaphysis and epiphysis. In normal cases the junction is shown by a very narrow translucent straight line separating the redness of the shaft from the greyish colour of the epiphysis. When " chondro-epiphysitis " is present there is a definite broad area of demarcation sometimes as much as 2 or 3 mm. wide. This area is yellow, opaque and granular and shows irregular projections on its epiphyseal side. Cases in which these appearances are well shown are marked + + or +, doubtful cases in which the deviation from the normal is slight are marked ±.

The table below shows the occurrence of chondro-epiphysitis in syphilitic and traumatic cases.

	Syphilis.	Trauma.
+ + ...	4	0
+	14	0
±	5	1
Negative	0	65

These figures speak for themselves and show the overwhelming preponderance of this change in syphilitic compared with traumatic cases.

Wassermann Reaction of Mother.

In many cases there has been considerable difficulty in obtaining consent to take the blood for this reaction.

This difficulty has become greater, not unnaturally, perhaps, when a repeat examination has been desired some time after the birth of the child.

The following results have been obtained :—

Syphilitic Cases.

Number examined.....	17
Positive	12
Negative	5

Of the 12 positive results one case was negative seven days after the birth but was positive six months and nine months later.

Of the five negative results two were examined twice; in the first case three days and one month, and in the second seven days and

five months after the birth. In the remaining three cases, which were examined three days after birth, repeat examinations could not be obtained.

Traumatic cases.

Number examined	20
Positive	0
Negative	20

Two cases were examined twice each. Fifteen cases were fresh, five macerated. These results seem to show that the mother of the syphilitic fœtus usually has a positive Wassermann reaction though it is not necessarily so. On the other hand, the birth of a stillborn fœtus, the cause of whose death is other than syphilis, has no tendency to produce a positive Wassermann reaction in the mother.

A positive reaction in the mother of a still-born child is therefore of value in making a diagnosis of syphilis as the cause of that still-birth, but a negative reaction does not exclude such diagnosis.

The Sachs-Georgi flocculation test has been carried out at the same time as the Wassermann reaction, and has substantially agreed with it in all instances.

From these observations it appears that certain criteria emerge which tend to occur far more frequently in cases of syphilitic as compared with those of traumatic causes, *viz.* :—

	Syphilitic.	Traumatic.
1. Maceration	100 per cent. ...	27.3 per cent.
2. Prematurity	77 „ ...	34.9 „
3. Spleen above .45 per cent...	91.3 „ ...	3.0 „
4. Chondro-epiphysitis	100 „ ...	1.5 „
5. Positive Wassermann	70.6 „ ...	0 „

Of these by far the most striking are the enlargement of the spleen, the presence of chondro-epiphysitis and the Wassermann reaction.

Still-birth from Various Causes.

An analysis of cases of still-birth from various causes (toxæmia of pregnancy, epilepsy, deformities, etc.) gave the following results :

Spleen above .45 per cent.	0 in 21 cases
Chondro-epiphysitis	1 (±) in 21 cases
Wassermann reaction	all negative in 12 cases

Cases in which no definite diagnosis was made.

This series consisted of 21 cases. The following is the result of analysis with regard to our three criteria—spleen above .45 per cent., chondro-epiphysitis and Wassermann reaction of mother.

Seven cases with spleen above .45 per cent.

	Spleen per cent.	C.E.	W.R.
1	.66	±	+ + +
2	1.2	−	+ + + +
3	.78	±	−
4	.9	±	Not obtained.
5	1.0	±	„
6	.9	±	„
7	.63	+ +	„

We consider that all the above should be diagnosed as "syphilis." In one case (2) chondro-epiphysitis was not observed but the mother had a positive Wassermann reaction.

Eight cases with chondo-epiphysitis, but spleen not enlarged.

	Spleen per cent.	C.E.	W.R.
1	.2	+	+ +
2	.2	±	−
3	.14	±	−
4	.4	±	−
5	.24	±	Not obtained.
6	.2	±	„
7	.37	+	„
8	.1	±	„

Of these cases we consider that No. 1 should be treated as syphilitic—the spleen is of normal size, but chondro-epiphysitis is definite and the Wassermann reaction positive,

No. 7 is a "border-line" case, spleen is above the average though not grossly enlarged.

No. 4 is perhaps suspicious with spleen .4 per cent.

In cases 2 to 8 we should suggest a "provocative" dose of a salvarsan compound and a Wassermann reaction.

The remainder six cases gave no evidence of syphilis :—

	Spleen per cent.	C.E.	W.R.
1	.2	–	–
2	.2	–	–
3	.1	–	–
4	.3	–	–
5	.15	–	Not obtained.
6	.3	–	"

Conclusions.

The following points are of value in making a diagnosis of syphilis in the still-born when spirochætes have not been found in the tissues or it is not practicable to search for spirochætes :—

1. In favour of syphilis :—
   (*a*) Enlargement of the spleen (.45 per cent. of the body weight may be taken as a " border-line ").
   (*b*) The presence of chondro-epiphysitis.
   (*c*) A positive Wassermann reaction in the mother.
   (If possible this should be repeated some weeks after the puerperium.)
2. Against syphilis :—
   (*a*) No maceration of the fœtus.
   (*b*) The fœtus reaches full time.

No evidence can be obtained from :—

(*a*) The weight and length of the fœtus.
(*b*) The relative weight of the liver, kidneys or placenta.

We wish to express our thanks to the Obstetrical Staffs of St. Thomas's Hospital and the General Lying-In Hospital, who kindly provided us with material, and to the Medical Research Council for financial help.

Observations on the Neuro-Musculature of the Uterus.

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During the latter half of 1924 and the earlier months of 1925 experiments were performed with the object of analyzing the movements of the uterus in pregnancy and parturition, and of ascertaining the factors that determine the onset of labour. Although these objects have not achieved actual attainment, certain of the observations have appeared to be not unworthy of record, and it is possible that they may afford some slender guide to others who engage in this attractive and potentially fertile field of research.

Apart from occasional reference to such previous publications as directly affect the experimental procedures and results under consideration, no attempt will be made to review the whole subject. An elaborate map of comparatively unknown territory can only prove dangerous and misleading. The work of other investigators has nevertheless been very carefully considered, and, together with clinical data, accepted as a basis for further experimental measures. There is, unfortunately, no royal road to the solution of these important problems; I have already ventured to allude to some of the difficulties,[1] but, provided these and other obstacles are frankly recognized, they are unlikely to withstand the course of future scientific enquiry.

Certain of the experiments were conducted in conjunction with Dr. J. H. Burn at the National Institute for Medical Research, others in the Pathological and Pharmacological Departments of Guy's Hospital. I am much indebted to Dr. H. H. Dale, to Professor Adrian Stokes, and to Dr. N. Mutch for laboratory facilities, and for their expert advice. Stress of other work unfortunately prevented the continued co-operation of Dr. Burn; otherwise the results might well have been considerably more satisfactory.

The Innervation of the Uterus.

Clinical and anatomical observations have forcibly suggested a reciprocal or differential innervation of the uterine musculature. The movements of parturition are not infrequently subject to imperfect co-ordination, which inevitably indicates a complexity of

neuro-muscular elements. Beckwith Whitehouse and Featherstone[2], among others, have propounded an engaging hypothesis in attempting to analyze the component factors. It must be noted, however, that experimental physiologists have hitherto failed to demonstrate the parasympathetic (sacral) nervous supply to the uterus which these authors presumably suggest; moreover, the uterine muscle is quite distinct in origin from that of the gut, and there is no *a priori* reason to support any analogy with regard to their respective modes of activity.

Our observations in this direction were made upon the pregnant and parturient rabbit and pregnant cat under the influence of urethane and, when necessary, ether anæsthesia; also upon isolated strips of uterine muscle maintained in the apparatus described by Burn and Dale.[3] As it is not my intention to formulate any definite theory or to draw any major conclusions, experimental details may here be omitted. So far as they have progressed, our experiments have merely represented the search for a clue, and attention will only be drawn to such features as appear worthy of note. Anatomical and physiological variations of the female genitalia in different species, and even in individual animals at different stages of the reproductive cycle, are well recognized, though not as yet fully understood. Any attempt to apply experimental observations to the interpretation of uterine function in the human subject is as difficult as it would be premature.

We could find no evidence of a direct nerve supply from the lower spinal cord to the pregnant uterus or vagina. No effect upon the musculature was observed to result from division of posterior nerve roots, division of anterior roots, or removal of the lumbo-sacral cord itself. Following section of the cord between the third and fourth lumbar levels, no uterine response could be obtained from electrical stimulation of the lower segment, although the bladder contracted vigorously under this influence. Similarly, electrical stimulation of the pelvic (spinal) nerves caused contraction of the bladder, but no obvious contraction or relaxation of the uterus or any of its constituent fibres. Pilocarpine, applied *in vitro* to surviving strips of uterine muscle, was also found to be without effect, motor or inhibitor—although I am aware that other observers have found positive results in this direction, and that pilocarpine has been used as an ecbolic.[4]

In spite of this apparent absence of a parasympathetic nervous supply, we have found indications to suggest that some form of differential innervation exists. It can only be assumed for the present that both or all of the component factors take origin from the sympathetic system proper, and proceed to the uterus and

vagina *via* the hypogastric nerves. It has been accepted that the sympathetic supply is generally motor to the uterus of the rabbit, whether pregnant or non-pregnant.[5] In the cat, the sympathetic nerve has been shown to be generally motor in pregnancy, but inhibitor to the non-pregnant uterus.[6] In those experiments in which the effect of sympathetic stimulation is essentially motor, the co-existence of inhibitor fibres has been demonstrated, although their influence is masked. In the vagina, both longitudinal and circular fibres have been found to contract under the influence of sympathetic stimulation, even in the non-pregnant cat.[7]

Apart from the last of these recorded observations, there has been a tendency to regard the musculature as a whole, whereas it has been our object to note the progress of spontaneous movements and the results of stimulation as they affect the various individual groups of muscle fibres. We have repeatedly observed that electrical stimulation of the hypogastric nerves, and the intravenous injection of adrenalin, affect certain elements of the utero-vaginal musculature rather than others. These differential effects have been reproduced, or even accentuated *in vitro* by the addition of adrenalin to the Ringer's solution in which selected strips have been suspended.

The expulsive activities of the vagina are well defined, especially in the rabbit, and further reference will be made to these; but the movements of the uterine horns have proved extremely difficult to analyze. In the first place, they appear to be influenced comparatively little by an extrinsic nervous supply; secondly, on account of the necessarily complicated nature of the experiments, it has been practically impossible to make satisfactory use of any form of mechanical recorder (*e.g.*, Cushny's) in studying the movements of two or more groups of fibres at the same time; thirdly, there seems to be a certain lack of uniformity of neuro-muscular arrangement that applies, not only to animals of different species, but also to different individuals of the same species. This latter factor probably depends to some considerable extent upon the stage of pregnancy, or upon additional influences that may be introduced at the onset or in the course of parturition.

The movements of the uterine horns are not peristaltic, although they are obviously effective in propelling the fœtus to the vagina. In the rabbit, the usual result of hypogastric stimulation or of adrenalin injection was found to be contraction of the circular fibres and of the longitudinal fibres along the line of attachment of the broad ligament, together with contraction of the well-developed muscle fibres of the broad ligament itself; the longitudinal fibres along the opposite convex surface of the uterine horn were inhibited. In the cat, the effects of stimulation were little

marked and variable. In no case did the uterus contract as a whole; the effect of intravenous injection of pituitary extract invariably afforded a marked contrast in this respect.

The vagina responded very definitely to electrical stimulation of the hypogastric nerves and to adrenalin injection. In rabbits, well-marked peristaltic waves proceeded from the utero-vaginal junction downwards. The circular fibres at the valve-like utero-vaginal orifices contracted forcibly at the onset of each wave.

In view of the vigorous vaginal response to stimulation in the living animal as compared with the feeble reactions of the uterine muscle, it was somewhat remarkable to find that, on the whole, the latter responded more actively than vaginal muscle to the influence of adrenalin *in vitro*. It has been impossible to escape the impression that the movements of the uterine horns are largely automatic, whereas those of the vagina, the essential expulsive organ in these animals, are to some considerable extent under extrinsic control. In this respect it is worthy of note that the nerve supply to such a comparatively enormous organ as the pregnant uterus of the cat or rabbit at term should merely consist of tiny filaments.

In the process of parturition, a "bearing down" reflex was elicited, even under deep anæsthesia, each time a peristaltic wave forced the presenting pole of a fœtus into the lower end of the vagina. This was characterized by contraction of the diaphragm and abdominal muscles so vigorous as to drive the abdominal viscera forcibly through the operation wound. The same reflex was readily initiated by the inflation of a small balloon introduced into the lower vagina of a non-parturient animal, and even by digital pressure on the perinæum within the vaginal canal.

The Causation of Parturition.

In spite of an opinion not infrequently expressed, the injection of considerable quantities of pituitary extract into pregnant women before term appears to have a practically negligible effect as regards the induction of labour. But, when labour has actually commenced, the injection of such small amounts as one or two minims of any standard preparation of posterior lobe is found to have a very decided influence on the uterine contractions. Various suggestions have presented themselves as possible explanations of this phenomenon. In the first place, there may be a comparative excess of pituitary secretion on the part of the mother at term, due to some factor such as has been indicated by Dixon and Marshall.[8] Secondly, the fœtus itself may produce an effective supply of pituitary secretion *in utero* when its development has attained a certain level. Thirdly, and most probably, an additional or sensi-

tizing factor may arise and act in combination with the pituitary influence. Experiments have been conducted to test the validity of these hypotheses.

The detection of the pituitary principle in circulation is a matter of extreme delicacy, and under normal conditions tests hitherto applied have proved generally negative. On this account, the further negative reactions here recorded must not be accepted as conclusive. Attempts to demonstrate a possible pituitary excess were made in two directions.

The melanophore (frog) test, as modified and described by Fenn,[9] was used in connection with serum obtained from women in pregnancy and in labour. Of ten experiments, only one result proved positive. In this latter case, the blood was obtained at a late stage of labour. Since these results have been negative on the whole, it is unnecessary to consider the potential objection raised by the conclusions of Dreyer and Clark,[10] to the effect that melanophore dilator, oxytocic, and pressor principles of the posterior pituitary lobe are distinct entities.

Further observations were made as to the influence of serum obtained from the blood of pregnant and parturient women upon the contractions of the uterus of the virgin guinea-pig, after the method of Burn and Dale.[3] Compared with the action of sera of non-pregnant women and of men, the results were again negative. Incidentally, serum obtained from cases exhibiting albuminuria of pregnancy was also without effect in this direction.

It must be remembered that Dixon and Marshall[8] postulate the removal of an inhibiting factor, rather than the introduction of an agency that leads to actual excess of pituitary principle in the circulating blood over and above the normal. These particular results, therefore, are not opposed to their conclusions.

Although the fœtal pituitary seemed to be an improbable source of the factor responsible for the onset of parturition, the possibility of such a uterine stimulus arising *in loco* led to experiments along two lines.

The melanophore test was applied to a series of specimens of blood obtained from the placental end of human umbilical cords immediately after the latter had been severed in the course of normal labour. In every case the result was negative.

In a pregnant rabbit near term the abdomen was opened under aseptic conditions; three fœtuses were found *in utero*. By means of a syringe and fine needle, a small quantity of pituitary extract in saline was injected *via* the uterine wall into two of these, whilst saline only was injected into the third as a control. The abdominal wall was then sutured, and the animal allowed to recover. Parturi-

tion failed to follow, and on the next day the rabbit was killed and the uterus opened. The control fœtus was found to be alive, the other two were dead. In spite of their death and of apparent *post-mortem* changes in their placentæ, there was no obvious evidence of placental separation from the uterine wall, or of displacement of the fœtus concerned. A similar experiment was performed upon a pregnant cat. In this case none of the fœtuses was killed by the injections of pituitary extract, but labour again failed to result, and no change was noted in the condition of the fœtuses or placentæ *in utero* upon the following day.

In the course of an experimental study of the movements of the uterus in animals, Ludwig and Lenz[11] found that combined injections of pituitary and placental extract resulted in the onset of labour, whereas their separate use was ineffective in this respect. The hypothesis implied is certainly attractive, as it would seem not improbable that autolysis of the placental "infarcts" found at term should liberate "pressor bases," such as tyramine, which might combine with the pituitary principle in circulation to stimulate uterine activity. Unfortunately we have at present no satisfactory means of detecting the relative amounts or even the presence of these substances as they exist in the blood-stream. The same difficulty applies to the estimation of a possible adrenalin factor. It has been suggested that adrenalin may play a considerable part, and, indeed, the comparatively large size of the adrenal gland in the fœtus at term has been adduced as an argument in favour of this view. An objection to the latter idea, however, is provided by the anencephalic fœtus, in which the gland is usually of the smallest size, although the onset and course of labour are not commonly abnormal.

In the following experiments, human placentæ were obtained under conditions as aseptic as possible, and selected portions, including "infarcted" areas, were extracted by grinding with sterile sand and saline shortly after delivery. The extract thus obtained was allowed to stand for a short time, and the supernatant fluid centrifugalized. Bacteriological tests were applied to the final extracts in all cases to ensure sterility. Various dilutions of unboiled extract were prepared, and further portions were boiled for a brief period in a water bath and subsequently filtered. Messrs. Parke, Davis and Co. kindly prepared for me an extract for purposes of control.

Although the induction of parturition was not attained by the injection of any of these extracts, either alone or in combination with pituitary extract, certain of the results have appeared to be of interest.

Single intravenous injections of unboiled placental extract into rabbits, pregnant or non-pregnant, produced no obvious effects. Similarly, the intravenous injection of pituitary extract alone produced no obvious effects. But the intravenous injection of pituitrin and unboiled placental extract in combination, and in similar doses, caused sudden death of the rabbit, whether pregnant or non-pregnant. Repeated intravenous injections of unboiled placental extract alone also led to sudden death. The boiled extract and the corresponding extract supplied by Messrs. Parke, Davis and Co. were without effect, either in combination with pituitrin or in repeated doses. In this latter connection it may be noted that the "pressor bases," to which reference has previously been made, are not destroyed by boiling. Repeated subcutaneous injections of unboiled placental extract combined with pituitrin were apparently ineffective, as were small intravenous doses of diluted solutions.

The cause of death under the conditions outlined seemed worthy of further investigation, as, apart from the immediate issue, a clue to the pathology of eclampsia was suggested by the possibility of a combination of pressor influences originating from the pituitary and placenta respectively. This supposition was not upheld by experiment. Observations were made upon a decerebrate cat, and upon a further cat and a rabbit under anæsthesia. In the decerebrate cat, supported by artificial respiration, the intravenous injection of placental extract had no effect on the heart or blood-pressure; simultaneous injections of placental and pituitary extracts produced exactly the same effect as that of pituitary extract alone. In the anæsthetized cat, placental extract caused a temporary fall of blood-pressure; but the combined injection of placental and pituitary extracts was not fatal, as in the rabbit. In the anæsthetized rabbit, the intravenous injection of placental extract caused a distinct and rapid fall of blood-pressure. Since this evidence contra-indicated the pressor influence presurmised, these investigations were not continued.

The observations of Dixon and Marshall[8] led one to suppose that it might be possible to accelerate the onset of labour by the application of an extract of ovary from which the corpus luteum element had been removed ("ovarian residue"), or to delay its onset by means of an extract of corpus luteum. Messrs. Parke, Davis and Co. supplied me with extracts similar to those used by Professor Dixon.

In the case of a pregnant rabbit mated on January 17th, parturition was normally due on February 16th approximately. On February 13th, 1 c.c. of "ovarian residue" was injected intra-

venously at 5 p.m., and repeated at 8 p.m., at 10 p.m., and at 10 a.m. on the following day. Parturition failed to commence at the time, and actually occurred on February 17th, *i.e.*, a day later than might have been expected in the natural course of events.

A further rabbit was mated on February 12th, and parturition was due on March 14th. One c.c. of corpus luteum extract was injected intravenously on March 10th, and this was repeated on the 11th and 12th. These injections failed to delay the onset of labour, which actually occurred on March 13th.

These results, therefore, do not afford support to the hypothesis on which the experiments were based.

Some little time ago I had under observation a clinical case which appeared to throw doubt upon the conclusions of Frænkel,[12] with regard to the function exercised by the corpus luteum in controlling attachment of the embryo to the uterine mucosa. A woman, two months pregnant, was found to have an ovarian cyst, which Mr. Bellingham Smith considered it necessary to remove. The excised ovary contained a well-developed corpus luteum of pregnancy; whereas the opposite ovary, which was left *in situ*, exhibited no sign of lutein tissue to the naked eye. In spite of the apparent absence of a corpus luteum from this early stage, pregnancy proceeded to term, and spontaneous delivery of a living child followed. Incidentally lactation was normal, although mammary development had appeared deficient during pregnancy. It may obviously be objected that the remaining ovary contained lutein cells that assumed the function of the excised gland, although these were not evident at the time of the operation.

In three pregnant rabbits, each mated ten days previously, laparotomy was performed, and the ovaries completely removed, together with their corpora lutea. In all cases the uterine horns contained fœtal sacs corresponding in size to the stage of pregnancy attained. All the rabbits recovered from the operation, and in none was there any external evidence of abortion. Pregnancy failed to develop, however, and the animals were subsequently killed and examined. Two were killed a month after the date of conception, and the third three weeks later. In the former the fœtal remains were found *in utero*, in process of absorption; death of the embryos had evidently occurred shortly after the operation, although they had not been ejected, nor had their attachments been displaced. In the third rabbit, no fœtal remains were found, absorption having been complete.

It is well recognized that these observations merely represent an apparently disconnected series of experimental data, in spite of

their common objective; and that their results afford no real solution of the underlying problems. I can only hope that their publication may at least expose an occasional blind alley, or even suggest a constructive course to the more persistent and imaginative investigator who cares to bridge the obvious gaps.

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Absorption from the Human Vagina.

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Very little is known on the subject of absorption from the vagina. On clinical evidence it has been suggested that certain constituents of the semen are normally absorbed from the vagina and, circulating in the blood, exercise a physiological effect on the functions of the body generally. So far as the writer is aware no definite experimental evidence has been adduced to show that the human vagina does possess the power of absorption, and it was in order, if possible, to settle this question that the following research was undertaken at the suggestion of F. H. A. Marshall, F.R.S.

The vaginal canal normally contains fluid derived from two sources:—

(*a*) A thin milky fluid which is derived as a general oozing from the whole surface of the vagina. The fluid is clear, but becomes milky in appearance from the presence in it, in suspension, of numerous desquammated epithelial cells from the vagina which have undergone fatty degeneration.

(*b*) A thick glutinous fluid which is secreted by the glands of the cervix uteri.

Judging from the structure of the vagina—the lining composed of many layers of stratified epithelium and the absence of any glandular structures—one would imagine *à priori* that it would be incapable either of secreting or absorbing. That it normally "secretes" has long since been demonstrated by the constant presence of fluid in its cavity after the complete removal of the uterus. (Gow.)[1]

The clinical evidence in favour of and against the view that the vagina is capable of absorption may here conveniently be reviewed.

As has already been stated, the vagina always contains "secretion" derived from both its own walls and also from the glands situated in the cervix. The rate at which these "secretions" are normally produced is quite unknown. What happens eventually to them? Undoubtedly when in excess they escape from the vaginal orifice, producing the condition popularly known as "the whites," and

to the medical profession as "leucorrhœa." This escape of "secretion" is a condition which occurs frequently in women of all ages. On the other hand, many women pass months and years without noticing the escape of any fluid from the vagina, except that which marks the condition known as menstruation, and it seems reasonable to suppose that in these persons a continuous secretion and absorption is always taking place.

In the cases of imperforate vagina, as a rule no accumulation of fluid in this canal is noticed until after the patient has reached the age at which menstruation usually occurs. Presumably in these cases some, if not all, of the vaginal and cervical "secretions" are re-absorbed.

The writer is only aware of one recorded case which could suggest an accumulation of these "secretions" in an imperforate vagina. It is as follows:—

Specimen 3016a in the Museum of St. Bartholomew's Hospital, London, is thus described in the catalogue of specimens:—

"Genito-urinary organs of a female infant aged seven weeks. The large fibrous sac which has been divided in a mesial section is the vagina; it has been enormously distended by a puriform fluid owing to an imperforate hymen; the uterus, the cavity of which has also been distended, and the walls of which are thin, is situated at the upper part of a distended vagina, the bladder is enlarged, and has been completely drawn out of the pelvis thereby causing a great elongation of the urethra, the pressure has also acted on the ureters causing obstruction to the flow of urine in them with subsequent distension both of their walls and of the calyces of both kidneys.

The child was admitted on account of a soft fluctuating swelling presenting at the vulva thought to be a vaginal hernia. It became very ill and died; it was then found that the swelling was due to an imperforate hymen and that the vagina contained pus."

it is distinctly stated in this case that the fluid was puriform." The case occurred many years ago, and there is no note that a microscopic examination of the fluid was made, so that its character was probably judged by its naked-eye appearance.

If it was "pus" as stated in the catalogue, then the cavities of the vagina and uterus were really one large abscess cavity. It is highly improbable that this was a case of accumulation of normal cervical and vaginal "secretion."

In all other cases of imperforate vagina known to the writer no symptoms due to the collection of fluid occurred until after menstruation had probably been long established and the menstrual fluid had accumulated in the vagina for a considerable time. In such cases it is chiefly retained menstrual fluid and not cervical or vaginal "secretion" that has distended the vagina (hæmatocolpos).

In cases of hæmatocolpos there appears to be some evidence that absorption of menstrual fluid takes place from the vagina.

It often happens that attention is not drawn to the abnormal condition until menstruation has apparently been established for several years; the girl has perhaps experienced the sensations generally associated with menstruation at regular monthly intervals, but there has been no escape of menstrual fluid from the vagina. The fluid which has accumulated in the vagina has been measured in a number of instances.[1] In one case 100 ounces were thus retained, but the average amount noted was only half that amount. Careful observations have shown that the normal menstrual loss varies from four to six ounces per month. If the smaller amount be taken 48 ounces would be poured into the vagina in twelve months. This is the average amount found accumulated in the vagina in cases in which this organ is imperforate. As in some cases this fluid has been collecting for some five or six years, it appears that during this time from 200 to 250 ounces have been absorbed.

The fluid is also very thick and tarry; much thicker and more viscid than ordinary menstrual discharge. This suggests that some of the more fluid constituents of the blood have been absorbed, leaving the more solid constituents unabsorbed in the vagina. However, it must be remembered that in these cases the menstrual fluid is discharged from the uterus against considerable back pressure. This must be very considerable when the vagina has become greatly distended, as is often the case. It is well-known that by tightly packing the vagina with gauze or pledgets of cotton wool the amount lost at a menstrual period may be considerably lessened by the back pressure thus produced. It is, therefore, reasonable to suppose that in cases of hæmatocolpos less than the average amount of fluid is poured into the vagina at the menstrual periods, at any rate after that organ has become distended. This probably means that the amount calculated above (200—250 ounces) as having been absorbed from the vagina in the course of five to six years must be reduced, but by how much there is no evidence to show.

It is demonstrated that, whatever be the rate of discharge of the menstrual fluid in these cases, it is not all absorbed from the vagina before the next menstrual loss occurs. It must be remembered that the vagina probably soon ceases to be normal: its walls become greatly thickened and it is possible that its powers of absorption become impaired. We know also that certain constituents of the blood are very slowly absorbed when that fluid is extravasated into the tissues or into the peritoneum, though water and certain drugs are rapidly absorbed from these situations.

It has been suggested that absorption of semen takes place from the vagina.

It has been claimed that young chlorotic women usually lose their anæmia on marrying, whether they become pregnant or not, and that this beneficial blood change is produced by the action of a substance or substances absorbed by the vagina from the semen. The writer is not aware of any carefully noted observations on this point, and he has had no opportunities of making any himself.

Women are stated to enjoy better general health when sexual relations with their husbands are normal. Here again there are no careful observations. It is true that several of the writer's patients have voluntarily expressed this opinion to him, but he has not been able to satisfy himself that there was not a mental factor in these cases and that imagination did not play a part as great or greater than absorption of semen. Is any or all the semen ever absorbed? On this subject Matthews Duncan makes the following remarks:[3] "In the great majority of women the semen is retained." This observer is so accurate that his statements must be treated with the greatest respect. The writer has found it impossible for obvious reasons to make enquiry on this subject from most of his patients. He has, however, from time to time had suitable opportunities of pursuing the subject in the course of his clinical investigations into the causation of sterility, and has been able to satisfy himself that in some women the semen is to all appearances entirely retained and presumably absorbed.

The writer has recently discussed the retention of semen in mares and cows with an intelligent and experienced farmer who was for some years in charge of a stallion during the mating season. This man's experience is that in the majority of cases the semen is apparently entirely retained (presumably absorbed) in mares, though in some instances there is a definite escape from the vagina. This is his experience also in the case of cows.

But even if it be granted from the considerations just stated that substances such as normal vaginal and cervical "secretions," menstrual discharge and semen may be absorbed from the vagina, there is no available evidence to show whether such absorption takes place from the vaginal wall or from the mucous membrane lining the cervical canal *via* the external os uteri, or from both. A number of cases of mercurial and carbolic acid poisoning have been recorded in which the mercury or carbolic acid has entered the blood by way of the female genital organs.

Some years ago it was the routine practice to administer vaginal douches to all women during the first week or ten days after childbirth. Various chemical antiseptics were in this way introduced

into the vagina, and a number of cases of mercurial and carbolic acid poisoning occurred.

There was no doubt that the poison had entered the blood from the genital canal.

Several considerations must be borne in mind in discussing the evidence which these cases afford of absorption of substances from the vagina.

In the first place the vagina had recently been stretched, bruised, and perhaps lacerated by the passage of a fœtus. It is, therefore, quite possible that the poison reached the blood through areas of damaged vaginal wall, just as it might have done through similarly damaged areas of skin—for instance, through a surgical wound.

It must also be remembered that for some days after labour the canal of the neck of the uterus remains very patulous and communicates with the large cavity of the body of the uterus, the inner surface of which at this stage is probably a large absorbing surface from which any chemical might rapidly find its way into the blood. Thus, toxins, the result of decomposition of blood clot, are rapidly absorbed into the blood from this cavity. It is extremely easy in these cases for the end of the douche nozzle to be pushed accidentally up into the patulous external os, with the result that it is possible that the douche fluid may be forced up into the uterine cavity in considerable quantity, to be there retained and absorbed. Or even if the fluid is not forced into the cavity of the uterus some of it may be retained in the upper part of the vagina and patulous cervix uteri and be absorbed by the mucous membrane which lines the canal of the cervix.

It is, therefore, obvious that these cases cannot legitimately be pressed as affording evidence of the absorption of perchloride of mercury or carbolic acid by the normal vaginal wall.

In addition to this class of cases the writer is informed by Sir W. Willcox that several cases of mercurial poisoning have occurred in women in the vaginæ of whom nitrate of mercury had been placed in order to procure abortion. As the nitrate of mercury acts as a caustic, and rapidly produces an ulcer in the vaginal wall, such cases do not answer the question whether the normal undamaged vaginal wall is able to absorb mercury and to pass it on to the blood.

Clinical evidence of the absorption of quinine from the vagina is furnished by the following case which recently occurred in the practice of Dr. Arthur James.

The patient, a young married lady, is extremely sensitive to quinine: even very small doses produce a marked erythema. On two occasions she used a vaginal pessary containing five grains of

quinine hydrochloride as a contraceptive, and on both occasions the insertion of the pessary was shortly followed by a marked erythema. The patient was ignorant of the fact that the pessary contained quinine, and other cases of a similar nature are on record.

Experimental Evidence.

In devising experiments to ascertain whether the normal vagina in man (woman) is capable of absorbing substances into the blood certain considerations had to be kept in view:—

The substances employed had to be such as would not damage the vagina itself, and which would not, if absorbed therefrom into the blood, be capable of doing harm to the subject of the experiment. This excluded a number of substances the presence of which in the blood might have been demonstrated by their physiological action.

It was found advisable that the substances should be such that, if they reached the blood, they would be excreted in the urine and be easily and with certainty detected therein.

Steps were also taken to ensure that any substance placed in the vagina and afterwards found in the urine should have reached the blood-stream through the vaginal wall and not through the lining of the cervical canal by way of the external os.

Finally, contamination of the urine with the substances placed in the vagina during its passage from the bladder had to be guarded against.

After consultation with W. E. Dixon, F.R.S. (Cambridge), Beddard and Ryffel (Guy's Hospital), Monckton Copeman, F.R.S., and H. E. Archer (Biochemist, West London Hospital), it was decided to employ the following substances:—

Potassium Iodide, Sodium Salicylate, Quinine Hydrochloride, Glucose, Sucrose (cane sugar), Phenol Red, Methylene Blue.

These substances were introduced into the vagina in the form of vaginal pessaries incorporated in cacao-butter or gelatin. The cacao-butter was used only on a few occasions, as it was found messy to work with and was disliked by the patients. The pessaries dissolved in the vaginal cavity, and the substances which they contained came in contact with the vaginal walls. In order to eliminate absorption by the cervix uteri (*via* the os uteri externum) the upper part of the vagina, and sometimes the cervical canal also, was always carefully packed with gauze before the pessaries were introduced.

There were also a certain number of cases available in which the writer had completely excised the uterus with the ovaries and Fallopian tubes some months previously. In these

cases absorption from any surface except that of the vaginal wall was entirely excluded. After the insertion of the pessaries into the vagina a plug of cotton wool was placed just inside the vaginal orifice and the patient was kept in bed.

Great care was taken to avoid contamination of the specimen of urine examined by any of the vaginal contents reaching it. Before obtaining the urine the parts in the region of the vaginal and urethral orifices were thoroughly washed with an antiseptic lotion and then with sterile water, and the urine was then drawn from the bladder through a sterile catheter.

In investigating the urine the writer has had the valuable assistance of H. E. Archer, Biochemist to the West London Hospital, and for carrying out the various clinical manipulations that were necessary he is indebted to his former House Surgeon, Hope Carlton.

Iodide of Potassium grs. 15 *to* 20 (.972 to 1.296 grams).

Observations were made on 12 cases. Potassium Iodide was found in the urine in nine of these cases from one to twelve hours after insertion into the vagina. In three consecutive cases no trace of the drug was found, and it is almost certain (though definite proof is wanting) that the dispenser who prepared the pessaries forgot to add the potassium iodide to three of them.

In two cases Dr. Archer estimated the amount of the drug excreted in the urine in 12 hours.

1. A patient whose uterus and ovaries had been removed. Grs. 30 (1.944 grams) were inserted into the vagina. The amount excreted in the urine in 12 hours was 6.5 grains (.4212 grams).

2. A patient who possessed her uterus and ovaries. Grs. 30 (1.944 grams) were inserted into the vagina. The amount excreted in the urine in 12 hours was 6.12 grains (.396 grams).

In one case (a patient whose uterus and ovaries had been removed) the urine was drawn off by the catheter every half-hour after grs. 15 (.972 grams) had been inserted into the vagina, with the following results:—

Time after insertion.	Result.
½ hour	0
1 hour	+ trace
1½ hours	+ +
2 hours	+ +
2½ hours	+ +
3 hours	+ +
3½ hours	+ + +
4 hours	+ + +

Sodium Salicylate grs. 15 (.972 *grams*).

Experiments were made in 12 cases. In all of these the drug was found in considerable quantities in the urine in from 1 hour to 12 hours after insertion into the vagina.

In one case (a patient whose uterus and ovaries had been removed) the urine was drawn off by catheter and tested every half-hour, with the following results:—

Time after insertion.	Result.
½ hour	o
1 hour	+ well marked
1½ hours	+ +
2 hours	Specimen unfortunately lost
2½ hours	+ + +
3 hours	+ + +
3½ hours	+
4 hours	+

Quinine Hydrochloride.

Observations were made in 10 cases.

In seven cases 15 grains (.972 grams) were inserted into the vagina. In one of these there was a slight but definite quinine reaction obtained in the urine, as well as a definite alkaloid (Thresh's) reaction.

In two other cases Thresh's alkaloid reaction occurred, but no definite quinine reaction.

In the remaining four cases neither alkaloid nor quinine could be detected.

In three cases 30 grains (1.944 grams) were inserted into the vagina, and in all these (urine drawn off in 8 hours) there was a marked quinine reaction.

Glucose.

Ten cases. Grs. 150 (9.72 grams) to 180 (11.664 grams) inserted. In no case was glucose detected in the urine at any time up to 12 hours after insertion.

Dr. Archer estimated the blood-sugar in two of these cases:—

Case 1.—150 grains (9.72 grams) in vagina—

Blood-sugar before insertion of glucose ...	.12%
„ 30 minutes after	.12%
„ 60 minutes after	.11%

Case 2.—180 grs. (11.664 grams) of glucose inserted into the vagina—

Blood-sugar before insertion of glucose ...	.125%
„ after 30 minutes.....	.125%
„ after 60 minutes.....	.125%

Sucrose (Cane Sugar).

In five cases sucrose was placed in the vagina, and in all these cases it was detected in the urine.

In three of these 20 grains (1.296 grams) were inserted, and a trace of sugar was found in the urine drawn off after 8 hours.

In two cases 60 grains (3.888 grams) were inserted, and in each case the urine drawn off after 8 hours contained about .1 to .15 per cent.

Methylene Blue.

In 16 cases 3 grains (.1944 grams) were placed in the vagina, and in none of them was any coloration of the urine produced.

In two cases a similar pessary (grs. 3) was placed in the rectum, and in both cases the urine drawn off in 8 hours was very blue.

Phenol Red.

In six cases a pessary containing .05 grams was inserted into the vagina.

In one case there was a well-marked reaction in the urine after 8 hours.

In one case there was a faint reaction in the urine after 8 hours.

In four cases no trace of phenol red could be detected in the urine after 8 hours.

An unsuccessful attempt was made to find out whether the vagina absorbs water.

A rubber bag, inserted into the vagina in a collapsed condition and afterwards inflated, was employed in the hope that it would act as a ball-valve and would prevent water, which had been injected through a tube that pierced the bag, from escaping.

It was, however, found that the water invariably escaped from the vagina shortly after injection, between the vaginal wall and the rubber ball.

Conclusions.

There is positive experimental evidence that Potassium Iodide and Sodium Salicylate are rapidly absorbed and are found in the urine an hour after being placed in the vagina.

Also that Quinine, Cane Sugar, and Phenol Red are absorbed from the vagina and excreted by the kidneys, though not so rapidly as the above-mentioned salts.

In the case of Glucose it seems probable that absorption occurs, but that oxidation takes place so rapidly that detection is impossible.

Methylene Blue is apparently not absorbed, or only absorbed in very minute quantities.

There is clinical evidence that Quinine is absorbed.

References.

1. Gow. *Obstet. Soc. Trans.*, vol. xxxvi, 1894.
2. Duncan, Matthews. *Clinical Lectures*, p. 108.
3. Duncan, Matthews. *Ibid.*

The Investigation of the Uterus and Fallopian Tubes by Air and Opaque Bodies in Sterility.*

By Sidney Forsdike, M.D. (Lond.), F.R.C.S. (Eng.).

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Inflation of the uterus and Fallopian tubes has been practised for many years as a help to the elucidation of sterility in the female, but hitherto the apparatus necessary has been so cumbersome and elaborate as to forbid the investigation as a clinical test. I have used a simple apparatus for a considerable time in a routine way in the Out-Patient Department, and venture to bring it before this section of the Royal Society of Medicine.

Precedent to the application of the test the following conditions are observed :—

(*a*) That the semen of the husband is normal, for it is clear that no investigation for sterility should take place on the female until the male is known to be normal.

(*b*) The absence of acute or subacute inflammation of the adnexa lest it be aggravated.

(*c*) The cervix must be free from purulent discharge lest infection be carried upwards to the uterus and tubes.

(*d*) The time must be well spaced from the menstrual period, for the endometrium is congested and thickened, thereby offering resistance to the passage of any fluid, save at a much-increased pressure. Moreover, we have lately heard a deal about air embolism during urethroscopy when slight hæmorrhage was taking place, and I conceive that this might happen in the menstrual uterus.

Apparatus. A hollow uterine dilator, which is the third in the series, well tapered and with the opening at the tip.

The bulb and reservoir ordinarily used with a Junker chloroform inhaler. The reservoir has a specially constructed net of strong twine which gives it a fixed support.

Two points about this simple apparatus are noticed :—

(1) The uterine tube, being tapered, fits the os accurately, and the resilience of the cervical muscle grips it tightly and prevents

* A paper read before the Obstetrical and Gynæcological Section, Royal Society of Medicine, March 5th, 1925.

the escape of air. There is no necessity for the various devices for occluding the os and preventing the backflow of air.

(2) No manometer is used or necessary, for my experience is that when either uterus or tube is under tension and air does not pass, obstruction is present, and I proceed to the further investigation by means of opaque substances. For practical purposes, however, I measure the pressure in the reservoir by testing it beforehand against a manometer, and thus obtain reasonably accurate information of the pressure employed.

Again, it is noted that the apparatus is not burdened with gas-containing cylinders. Various gases have been used—Oxygen, Carbon Dioxide and air—the two former involve the use of cylinders, whereas air requires no additional storage. The question arises whether there is any valid objection to the use of air as against Oxygen or CO_2, and considering how we expose the peritoneal cavity during operation without ill-result, the answer must be, "there is no real objection." The difference in the rate of absorption of small quantities of these gases must be negligible.

Methods Employed. The test can be employed in the Out-Patient Department. The patient places glycerine plugs against the cervix on the two nights preceding the test. She is then put on the couch in the Trendelenberg first position, for two reasons:

(1) The supra-pubic area forms the dome of the abdomen, so that any air entering the abdomen forms a bubble in that area, where an increasing area of tympanites can be demonstrated by percussion as the quantity of air increases.

(2) In this position the vagina can be kept filled with saline solution, and any backflow of air is immediately detected.

The vulva, vagina and cervix are dried with swabs and thoroughly painted with iodine, the lowest part of the cervical canal being also cleansed and painted. A volsella fixes the cervix and the two early members of the series of dilators are passed through the internal os, followed by the third, which is the uterine tube. The bulb is now attached to the uterine tube and the vagina filled with sterilized saline solution or water. Pumping slowly, the reserve bulb is soon filled and its net under tension. If the tubes are patent the reservoir slowly deflates, the one fallacy being a leakage valve in the air-bulbs, which should, of course, have been detected beforehand.

Evidence of the passage of air into the peritoneal cavity. In the early days of tube inflation the pneumo-peritoneum was demonstrated by X-rays, and if that were necessary it would seriously diminish the value of the test clinically. Fortunately it is not necessary, for when the tubes are patent the air passes evenly and gradually, as seen by the deflation of the reserve bulb.

Secondly, on ausculation above the tubes the air can be heard on one or both sides, according to whether one or both tubes are patent. When there is a layer of fluid over the fimbriæ a succession of bursting bubbles can be heard, at other times a gurgling or hissing noise, and whichever is heard can be immediately arrested by pinching the rubber connexion of the reserve bulb and uterine tube, and it is again restored upon freeing the tube.

The sounds produced by the passage of air through the abdominal osteum can be studied in the course of an abdominal operation to much greater advantage and accuracy than upon the *post-mortem* uterus, for in the absence of coils of living gut in the latter case the conditions are not comparable. The uterine tube is introduced before opening the abdomen, and when the pelvic organs are exposed inflation is carried out.

When the lumen is fairly free and the pressure is raised to a 100 mm. Hg. a hissing noise is produced, if a layer of fluid be placed over the ostium a succession of bursting bubbles is heard. If the Fallopian tube be buried beneath coils of small intestine a gurgling is produced as the coil of intestine is raised by the increased pressure and separates from its neighbour to fall back again as the pressure is relieved.

Thirdly. An increasing globular area of tympanitic resonance can be demonstrated suprapubically on percussion, as the quantity of air in the peritoneal cavity is increased.

Quantity of air passed. In my earlier cases I pumped air into the peritoneal cavity until the tympanites was well marked; this resulted in considerable discomfort to the patient even in the Trendelenberg position, and sharp pain in the chest and embarrassment of the heart's action on regaining the upright position. With further experience I find it necessary to inject only a few cc. of air, the passage of which can be shown by the aforementioned methods. With this modification I have no hesitation in carrying out the test in the out-patient department, for few patients make any complaint, and at most it is of a slight pain in the shoulders which passes off before leaving the hospital or house; one only informed me that she noticed it for three days.

Failures. If the patient has vaginismus or is hyperæsthetic, or it is difficult to pass a probe through the internal os, failure will follow unless she is first anæsthetized.

The pressure to be used. Much discussion has ranged round the rate of flow of the gas into the uterus, the measurement of the total pressure, and whether obstruction is to be inferred at 100, 150 or 200 mm. Hg. To answer these problems it is necessary to see what happens when the inflation is carried out while the abdomen is open.

With the abdomen open and the pelvis filled with saline solution to a level at which the abdominal ostia are submerged, air passes through some tubes without delay and at a pressure not greater than 50 mm. Hg. In some cases air did not pass until the reserve bulb was under tension which indicated a pressure of 95-100 mm. Hg., and in these cases the uterus became tense for a fraction of time before the air passed and the viscus resumed its normal appearance. In these cases the Fallopian tube appeared to be flaccid and collapsed, thereby offering resistance to inflation, and upon subsequent inflation the air passed without tension. These cases are certainly not due to organic obstruction, but rather to a transient phase of a normal tube. It is clear that neither of these calls for an abdominal operation. When obstruction is present distension of the organs takes place according to the site of obstruction; when the block is at the uterine end of the tube distension of the uterus only takes place, it stands up, the peritoneal surface is taut and when grasped it feels like an air cushion and no more air will pass into the viscus. I am not able to confirm Bonney's observation that distension of the uterine cornua takes place, and I do not think that anything in the nature of rupture or even local bulging of the uterus is possible at legitimate pressures.

When the block is in the tube or at the fimbrial end, air does not pass and the stress falls first upon the relatively thin-walled tube and later upon the uterus. The tube passes into a state of tension and presents the appearance of a solid viscus with the covering peritoneum tense; this happens at a pressure of 95-100 mm. If the pressure be considerably raised dilatation goes on, the wall becoming thinner and almost transparent, and I have no doubt that, were it maintained, rupture would ensue. From these observations we may conclude that, wherever the obstruction, a pressure which is just sufficient to produce distension of an organ, is safe; whereas higher pressures place the Fallopian tube in some danger if they are taking the stress. I find that 150 mm. Hg. is the maximum required, and never work beyond that. It is not necessary to push the investigation beyond this limit clinically, for in common with the other hollow viscera the uterus and Fallopian tube when under tension give rise to acute pain and vagal disturbance, which is instantly relieved upon lowering the pressure; and passes off more slowly, if the pressure be maintained but not increased, as the distended viscus accommodates itself to the pressure. Therefore, as soon as the patient complains of pain I stop the procedure and conclude that there is obstruction.

Localization of the obstruction. Having concluded that there is obstruction, it is of some practical importance to decide upon the

site of it; this I proceed to do by the injection of an opaque substance, lipiodol. The patient is sent away for a week to allow of the absorption of the air introduced, otherwise it would be impossible to displace it by the opaque substance.

Lipiodol is a viscous oily compound of iodine (40 per cent.) and oil. The iodine is chemically closely bound to the oil, for it does not give the iodine test for starch, and is freed only when heated, copious purple fumes being evolved. The opacity to X-rays is due to the iodine content, and Sicard first introduced it into radiology for localization of tumours of the spinal cord.

The patient undergoes the same preparation as for air inflation, with the addition of an aperient 24 hours beforehand. She is then placed in the lithotomy position, and with the same precautions and procedure the uterine tube is introduced into the uterus. The uterine tube is now connected to a record syringe by a short length of rubber tubing, both of which are filled with lipiodol. The vagina is then plugged with gauze to maintain the tube in position and to prevent leakage of the lipiodol on to the X-ray couch. The patient is removed to the X-ray room, and screened while the lipiodol is being injected. When she complains of pain a photograph is taken.

Pain is complained of, when there is obstruction, owing to the distension of the viscera behind the block, and it continues and becomes more acute if the pressure be increased, but is instantly relieved on lowering the pressure. When tension is produced by lipiodol our object is achieved, for the opaque body has arrived at the seat of obstruction, and we can lower the pressure and are ready for the photograph. Secondly, there is an acute transient pain when the first drop of lipiodol touches the pelvic peritoneum, this passes off in a few seconds.

The effects of Lipiodol. Lipiodol is completely absorbed from the peritoneum in from 7-10 days, and no shadow can be seen after the latter date. For two or three days following the injection there may be some uterine hæmorrhage, but it passes off and no further disturbance has been observed. The question as to whether the lipiodol has any ill-effect upon the epithelium of uterus or tubes, or even upon the peritoneum, is of grave importance, and the answer is "No." I conducted a series of experiments upon cats and rats, injecting lipiodol into the Fallopian tubes and widely into the peritoneum. Examination of the tissues from three days to six weeks showed no evidence of peritoneal irritation, nor yet of disturbance of the epithelium lining the uterus. Furthermore, I opened the abdomen of a patient who had been injected six days before, and, although I found a small pool of lipiodol in the pouch of Douglas, there was no evidence of peritoneal irritation.

The radiogram after lipiodol injection shows us:—

(1) Position, appearance and direction of the Fallopian tube.

(2) The exact site of obstruction, whether in isthmus or ampulla.

(3) Whether an operation for relief of obstruction is advisable when the fimbrial extremity is closed, or inadvisable when the block is at the cornual extremity.

These two methods of investigation, when combined, seem to be a considerable step forward in estimating the wisdom of an abdominal operation for sterility, for they not only tell us that the Fallopian tube is blocked, but also show us the point of obstruction. I consider that any operation for restoring the lumen of the Fallopian tube when obstruction exists at the cornual end is doomed to failure, and, despite the ingenious operations devised and figured to this end, do not believe that they are ever attended with success.

On the other hand, a more hopeful outlook attends the restoration of the lumen when the fimbrial extremity is occluded, for when the abdominal ostium can be opened by the unfolding and conservation of the fimbriæ, there is some prospect of their remaining open with a possible subsequent pregnancy. It is in this class of case that inflation may subsequently be carried out both to maintain the restored ostium and to demonstrate that the operation has been a success.

The advantages of inflation without anæsthesia lie in the larger number of cases that can be investigated, without calling upon hospital beds which are already taxed to the utmost capacity. When inflation is positive valuable information is gained, but when negative the result affords no indication for treatment. The injection of lipiodol, however, supplements the negative information and indicates the site of proximal obstruction, but tells us nothing of the state of the Fallopian tube beyond the obstruction. This is of considerable importance, for I have set out to relieve obstruction at the isthmus of the tube, only to find that the ampullary end of the tube was completely disorganized. Criticism may possibly be directed to the amount of dilatation of the cervix necessary while the patient is conscious; the answer is that only about 10 per cent. require an anæsthetic, the remainder suffering no greater inconvenience than that of fixing a volsella in the cervix and passing a sound into the uterus.

In conclusion, I wish to thank Dr. Gray for her clinical help, and Dr. Berry's assistants, Miss Gray, Miss James and Miss Foulds, for the radiographic work.

Case 1.—One child sterility. Both tubes are obstructed at the fimbrial end and show clubbing. Laparotomy confirmed the diagnosis, and both ostea were opened up.

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Case 2.—The uterus and right Fallopian tube are well marked, the latter much distorted. There are also some shadows on the left side of the pelvis, some lipiodol having entered the left tube, but there is none in the peritoneum.

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Case 3.—Both tubes are seen in a hanging position, and both contain lipiodol; in addition there is a pool of it in the pouch of Douglas. The volsellum marks the level of the cervix.

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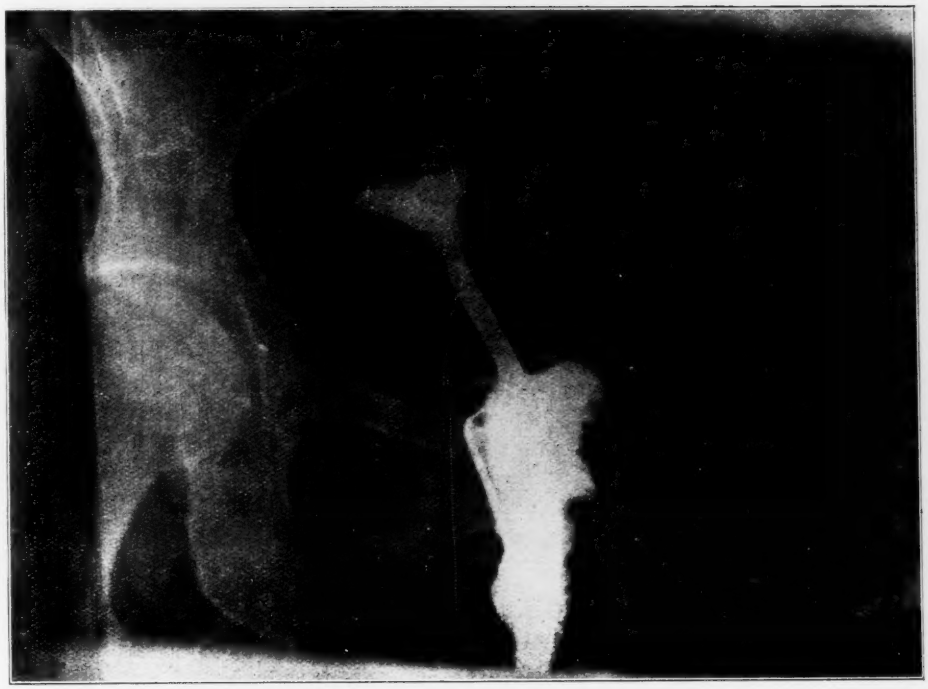

Case 4.—Lipiodol fills the uterus, but the tubes are completely occluded. *Laparotomy*: uterus normal in size, but the tubes were completely disorganized. There is no lipiodol in the peritoneum, but the upper part of the vagina is filled with it.

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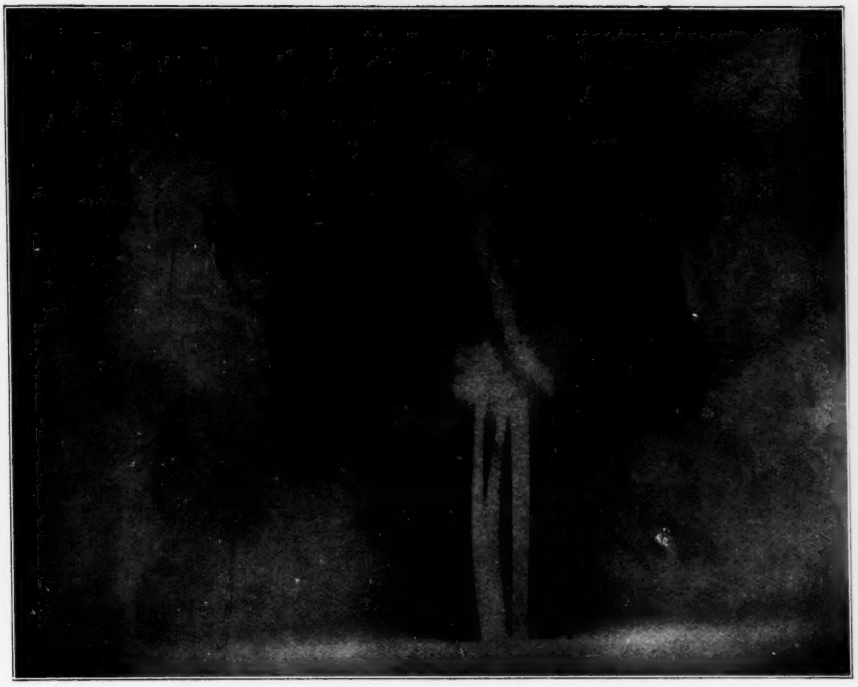

Case No. 5.—Volsellum on cervix, with a pool of lipiodol in the vagina. There is complete obstruction of the left tube at the cornu, but the right tube contains lipiodol and the obstruction is at the distal end, for there is no oil in the peritoneal cavity.

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Case 6.—Uterus and both tubes are injected, the latter, however, are obstructed at the fimbriated extremity. There is no lipiodol in the peritoneum.

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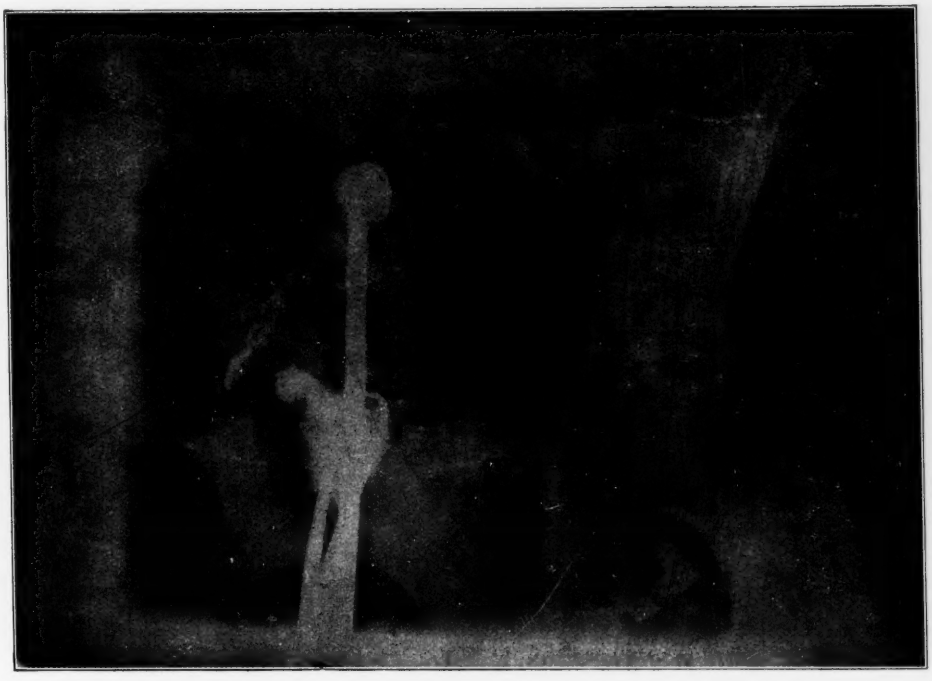

Case 7.—Shows a small infantile uterus, with both tubes occluded at the uterine extremity. Laparotomy confirmed the radiographic appearances.

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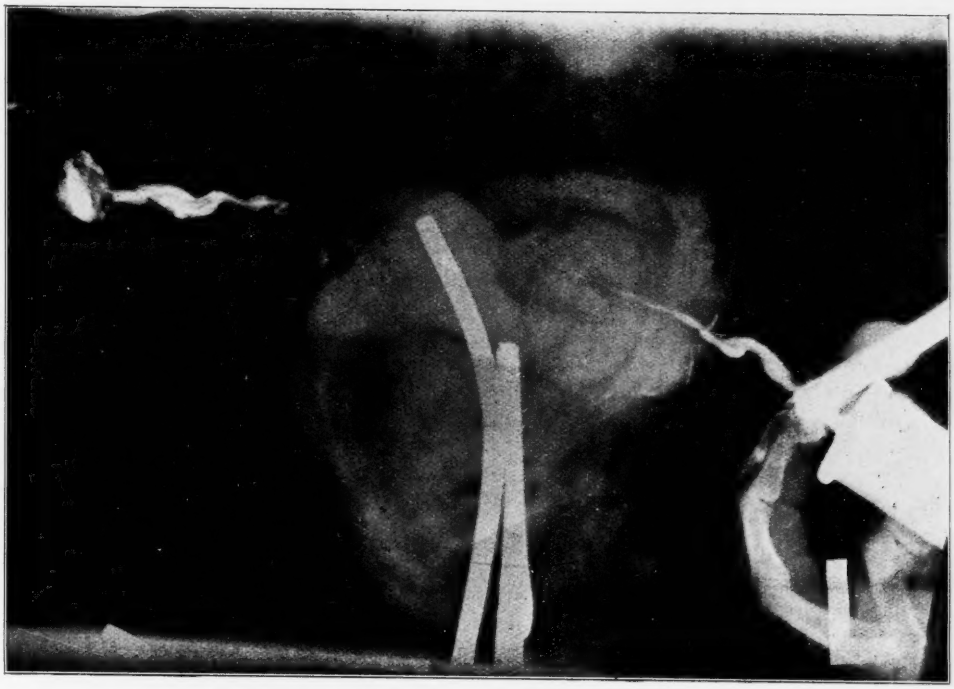

Case 8.—Uterus and tubes injected with lipiodol post-mortem.

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Cases.

(1) P. B., æt. 29, married nine years, one child seven years ago, no pregnancy since. Periods 3/28 regular. Husband: Spermatozoa present in large numbers and actively motile. 11/9/24 Tubes inflated—negative. 27/11/24 Lipiodol injected. Both tubes are patent up to the fimbrial end, where they show clubbing. Note the tubes in normal position. This patient had a sharp uterine hæmorrhage the day after injection, but no abnormal disturbance has happened since.

(2) N. W., æt. 31, married nine years. No pregnancy. Periods reg. 3-4/28. Husband: Spermatozoa present in large numbers and actively motile. Lipiodol is present in both tubes, the ends of which are sealed, for there is none in the peritoneum.

(3) E. S., æt. 34, married 14 years, one child 19 years ago. First husband killed in 1916. Second marriage 1917, no pregnancy or miscarriage. Periods reg. 4/28. Husband: Spermatozoa present in large numbers and actively motile. Lipiodol. Both tubes are prolapsed and contain lipiodol. In addition, there is a considerable pool of it in the pouch of Douglas. Six days later I opened the abdomen and found a small pool of lipiodol in the pouch of Douglas, but there was no evidence of irritation of the peritoneum. Gilliam's operation. Air-injection positive.

(4) P. H., æt. 29, married seven years. No pregnancy. Periods reg. 5/28. Husband: Spermatozoa few in number, motility diminished. Air inflation negative. Lipiodol fills the uterus, but there is a complete block at the cornual ends of the tube. Laparotomy showed both tubes disorganized, the right containing a hæmato-salpinx and the left a hydro-salpinx.

(5) I. B., æt. 33, married five years. No pregnancy. Periods reg. 3/28. Husband: Spermatozoa present in moderate numbers and motile. Anæsthesia. Lipiodol injected. Left tube completely blocked. Right tube considerably distorted, but contains oil. None in the peritoneum. Air inflation not attempted as the procedure required anæsthesia.

(6) M. H., æt. 27, married six years. No pregnancy. Periods reg. 2-3/28. Husband: Spermatozoa present in small numbers. Lipiodol in uterus and both tubes, but none in peritoneum.

(7) M. S., æt. 26, married three years. No pregnancy. Periods reg. 4-5/28. Husband: Spermatozoa present in large numbers, 50 per cent. motile. Lipiodol injected—shows the tubes are blocked at the cornua. Laparotomy (Chronic Appendicitis). Inflation, no air passed beyond the uterus despite a high pressure. The uterus is small and infantile.

(8) Uterus and tubes removed *post-mortem* and injected with lipiodol.

The Changes the Blood Undergoes in Pregnancy and After, their Responsibility for the Toxæmias and their Treatment.

By J. E. R. McDonagh, F.R.C.S. (Eng.),
Surgeon London Lock Hospital.

Introduction.

Directly a woman becomes pregnant the protein particles in the plasma undergo the changes characteristic of dehydration or lysis. Some of the particles split up preparatory to going into solution, while others join together or agglutinate, increase in size and show a tendency to precipitate. These changes are due primarily to the protein particles losing some of their electricity, and they differ in no wise from those occasioned by the invasion of pathogenic micro-organisms and of other chemical intoxicants. As similar changes may be encountered in certain pathological conditions of the female generative organs and are met with to a slight degree during the menstrual period, the primary cause of the dehydration of the protein particles in pregnancy would appear to be of maternal origin. So long as the changes undergone by the protein particles remain within limits, a normal pregnancy results. But, should the protein particles be subjected to the same degree of dehydration on many occasions, as occurs when there are several pregnancies, pathological conditions may be produced, which show themselves at the climacteric or later. That pathological lesions are met with at the climacteric as a result of foregone pregnancies, sets one to wonder whether a so-called normal pregnancy should be regarded as a purely physiological process. Pregnancies in animals occasion the same changes as are met with in human beings, and a careful examination of these strongly suggests a linkage between the physiological and the pathological states. When the ordinary limits of dehydration are exceeded the so-called "toxæmias of pregnancy" are produced. But, between these and the normal, various stages may be marked out. The toxæmias are roughly of two kinds: (1) those occasioned by the sub-division of the protein particles (gelation); (2) those occasioned by the precipitation of the protein particles (gelato-hydration). The former is represented by hyperemesis gravidarum and the latter by eclampsia. Similar pathological conditions may be met with in infections and be produced by other chemical intoxi-

cants. In other words, there is no essential difference between the pernicious vomiting of pregnancy and splanchnic shock. There is also no fundamental difference between eclampsia and a certain form of uræmic and diabetic coma, and the nephritis occasioned by toxic doses of the salts of metals with large nuclei, such as mercury, thorium and uranium. All the changes the protein particles are liable to undergo in pregnancy may be encountered in a syphilitic infection. Indeed, pregnancy itself may account for a positive Wassermann reaction in a non-syphilitic woman. The toxic conditions met with in pregnancy may be encountered in what is commonly called "post-operative acidosis." Not only may anæsthetic drugs produce the same changes in the blood as does pregnancy, but also the treatment of the two conditions is the same. Considering that the toxæmias of pregnancy are usually the end-results of dehydration of the protein particles, a few remarks are necessary concerning the initial changes and the intermediate changes, which connect the two.

The Early Changes of Dehydration.

An ultra-microscopic examination of the serum shows the particles to be diminished in number and in Brownian movement. Some of the particles agglutinate and form clumps; these and other particles which are increased in size show a tendency to precipitate or to settle on the glass slide. The coagulation of the blood is retarded, the refractive index and viscosity of the serum are diminished, and the suspension stability of the red blood-corpuscles is reduced. There is a slight rise in the percentages of sugar, urea and amino-nitrogen in the blood, this being due to a separation of these previously adsorbed constituents from the protein particles as they are splitting up to go into true solution. When protein particles first undergo dehydration they give certain chemico-physical reactions which have led to such terms as "fibrinogen" and "pseudo-globulin." In my opinion, fully dehydrated protein is albumin and fully hydrated protein eu-globulin, fibrinogen and pseudo-globulin forming the intermediate links connecting the two extremes. Use may be made of some of these changes to test for pregnancy, but no test will be perfect, because positive results may be obtained in pathological conditions of the generative organs and during menstruation. One of the characteristic features of menstrual blood is its relative inability to coagulate. Retardation of coagulation is an invariable sign of early dehydration. Indeed, it is possible that it is a dehydrator which causes menstruation, and one which has its origin in the corpus luteum. Of the substances liberated from the protein particles when undergoing dehydration, the one most easily

detected is sugar. If sufficient sugar is liberated the plasma ceases to hold it in solution and it is voided in the urine. Therefore, by augmenting the dehydration a temporary glycosuria may be produced. In my experience the drug best able to increase dehydration is dimethyl-ammonium dimethyl-dithio-carbamate. If 0.01 grm. is injected intramuscularly and the urine is examined one, two, and three hours later, in the majority of instances, especially in the early stage of pregnancy, sugar can be detected with Nylander's reagent. This test may be positive as early as the fourth week, but it is apt to be negative in the later months of pregnancy, because by this time the protein particles which have resisted dehydration may have become partially hydrated. When an early pregnancy is suspected, it may be affirmed if a temporary glycosuria is obtainable, if the refractive index of the serum is low (1.3490 or under) and the suspension stability of the red blood-corpuscles is reduced (1.0 c.cm. or under).

The Intermediate Changes of Dehydration.

One of the effects of dehydration is to increase the number of the protein particles. Though these particles dissipate some of their electricity and part with some of their adsorbed constituents, they do not go into solution. This change is characterized by a marked reduction in the suspension stability of the red blood-corpuscles, by a fall in the refractive index and viscosity of the serum, by a pronounced increase of the fibrinogen, and by an acceleration of false coagulation. The term "false" is used because the change is more closely related to gelation than to coagulation. True coagulation is a physical phenomenon of conduction or dispersion, and not of dehydration. The readiness with which the red blood-corpuscles fall and the freedom with which the blood forms a gel lead to a venous congestion, particularly in the splanchnic area. The liver suffers the most congestion, and then the stomach and the upper part of the small intestine. This is probably the explanation of the vomiting and diarrhœa so commonly met with in pregnancy. Should the number of the protein particles be excessive true gelation occurs with the danger of atrophy of the liver and pernicious vomiting ensuing. The multiplication of the protein particles consequent upon the sub-division is an early manifestation of dehydration, hence the reason why hyperemesis gravidarum is apt to be the earliest toxæmia to appear. When the protein particles undergo gelation the red blood-corpuscles are particularly liable to undergo hæmolysis. According to the degree of hæmolysis produced depend the varieties of anæmias which may appear during pregnancy and the rarer clinical conditions of hæmoglobinuria and hæmolytic

jaundice. Should the sub-division of the protein particles proceed to their going into true solution the time may arrive when the liquid part of the plasma becomes super-saturated. The fluid medium may become super-saturated either with protein itself or with the adsorbed constituents with which the protein particles part when they are changed from the colloid state to the molecular dispersoid state. When the fluid medium can hold no more of the various substances in solution, they are filtered through the kidneys into the urine. As it is the blood and not the kidneys which have the power of selecting what they want to pass through and what they want to retain, it is incorrect to speak of the renal threshold for a certain substance being raised. When there is too much protein in solution in the blood it is passed in the urine, and from the presence of proteinuria it should not be inferred that there is an accompanying nephritis. In fact, in most cases the kidneys are not inflamed any more than is the case when sugar and ketone bodies appear in the urine. In the type of dehydration being discussed, the adsorbed constituents of the protein particles, or as I frequently refer to them as the planets of the protein suns, may be passed into the urine without their percentage in the blood being necessarily raised. This accounts for the presence of glycosuria in pregnancy, with or without an accompanying hyperglycæmia. When the planets are separated from their suns their metabolism becomes altered, and this is particularly noticeable in the case of the planet representing the fat. The altered metabolism of fat leads to the formation of acetone, diacetic acid and β-oxy-butyric acid, hence the occasional appearance of ketonuria in pregnancy. Should the change described proceed, the protein particles left in the colloid state are apt to become precipitated in the renal and cerebral capillaries, a result which gives rise to the toxæmia known as "eclampsia." On the other hand the precipitation may be limited to the splanchnic area, in which case acute yellow atrophy of the liver may occur. When many of the protein particles go into solution the suspension stability of the red blood-corpuscles is not enormously reduced. The refractive index and viscosity of the serum are not abnormally low, the blood does not coagulate readily, but the total content of the protein in the peripheral blood is lessened. The albumin to globulin ratio tends to be raised in favour of the former instead of the latter, and there is less fibrinogen. Should the blood of a pregnant woman have been subjected to a severe degree of dehydration prior to the pregnancy the added dehydration occasioned by the pregnancy may cause the protein particles to become hydrated. When such a change leads to a pathological lesion, the clinical picture presented is that of parenchymatous nephritis, or, as it is often called, "nephrosis."

The presence of hydrated particles in the plasma raises the suspension stability of the red blood-corpuscles and the refractive index and viscosity of the serum. The coagulation of the blood is little altered, but there is a marked increase of the globulin at the expense of the albumin. In practice these changes are not so clear-cut as they appear from the description, because one state may merge into the other, and cases are met with which link them together. Nevertheless, examinations of the blood of pregnant women do give an indication of what is happening and liable to happen. If a fuller account is required of the physical reactions characteristic of the changes the protein particles undergo, I must refer the reader to "The Nature of Disease."

The changes the protein particles undergo to cause the toxæmias of pregnancy can be considered now under three headings: (1) the toxæmia occasioned by an excessive number of protein particles in the plasma (gelation); (2) the toxæmia occasioned by many of the protein particles going into solution and those left behind settling in the renal and cerebral capillaries (gelato-hydration); (3) the toxæmia occasioned by the protein particles becoming hydrated. But, before dealing with these a brief reference must be made to the treatment called for in the milder forms of dehydration.

Treatment.

Dehydration is a process in which the protein particles forming the protective substance of the host are made by the invader to give up or dissipate some of their electricity. Therefore, the obvious treatment is to supply to the protein particles the electrons they have lost. This is achieved with metallic substances in virtue of the power of metals to conduct electricity, hence the reason for their positive electric charge. In the early stage of dehydration sufficient electrons can be conducted by manganese butyrate. In early pregnancy many of the subjective symptoms and objective signs such as mild albuminuria, glycosuria, and ketonuria may be made to vanish by injecting intramuscularly on three occasions at weekly intervals 2.0 c.cm. of a 1 per cent. solution of manganese butyrate. In later pregnancy and in more severe cases better results are obtained by injecting intravenously or intramuscularly on two occasions at four days' interval 0.01 grm. of the symmetrical urea of para-benzoyl-para-amino-benzoyl-amino-naphthol-3-6-sodium sulphonate, or "sup. 36" for short. Owing to the larger size of the nucleus of the urea compound the positively charged sodium atoms in the 6-positions have a greater conductor effect than the manganese atom in the fatty acid preparation. I have used both these preparations with success in cases of dysmenorrhœa in young women, on the supposition that the pain, etc., are the

subjective symptoms of dehydration. In very bad and stubborn cases of dysmenorrhœa, when the protein particles have undergone some degree of gelato-hydration, dispersion can be achieved only if the enlarged particles and clumps are broken up. Dispersion of this kind is wrought best with non-metals. The most suitable preparation is contramine (the carbon di-sulphide product of di-ethyl-amine) injected at four-day intervals in 0.125 grm. doses. The type of case which calls for contramine is represented by the woman who is thin, as a rule dark, perspires freely, and is "nervy." As often as not she has been curetted on several occasions.

The Gelation Toxæmia.

When dehydration leads to an enormous increase in the number of the protein particles, the blood tends to collect either in the portal or in the pulmonary circulation. Collection in the former may lead to shock, persistent vomiting and diarrhœa and to atrophy of the liver. Collection in the latter may lead to shock and œdema, with consequent inflammation of the lungs. The so-called "post-operative pulmonary embolism" is more often due to gelation of the protein particles producing a primary pulmonary thrombosis, than to a separation of a clot from one of the common iliac veins. This and the other pulmonary complications met with after severe operations in elderly patients do not differ from similar conditions encountered in pregnancy. The three following cases illustrate the gelation type of toxæmia.

Case 1. A woman aged 38 had two miscarriages at the fourth month, three and four years previously. The third pregnancy was marked by severe vomiting from the start, and on more than one occasion it was feared that induction would be necessary. When I saw the patient at seven and a half months she was vomiting persistently. She had lost much weight and the skin was dry and mildly jaundiced. The tongue was coated, sordes had formed round the mouth, and the breath was offensive. The temperature was raised. The bowels were loose. The urine was diminished in quantity, high-coloured, and contained some protein, casts and many pus cells due to a mild bacillus coli infection. The blood-pressure was low. The examination of the blood revealed the following features. The blood was dark red and coagulated (false) rapidly owing to a large quantity of fibrinogen. The refractive index of the serum measured 1.3489 instead of the normal 1.3500. The viscosity of the serum was 7.9 seconds as against the normal of 9.0 seconds. The suspension stability of the red blood-corpuscles was 5.8 cms., as against the normal of 0.2 c.cm. The figure given represents the column of plasma which separates from the red blood-corpuscles in one hour, in a tube containing 2.0 c.cms.

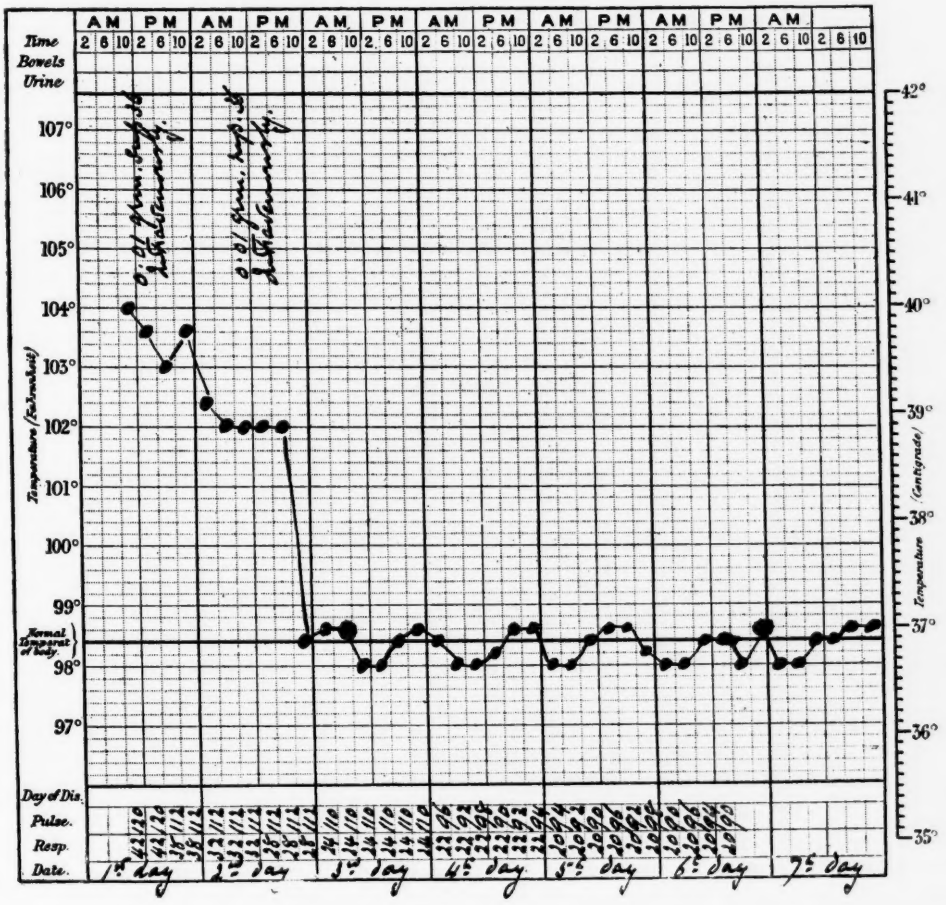
of a 2 per cent. solution of sodium citrate and 7.0 c.cms. of blood. The percentages of the blood-sugar and blood-urea were 0.137 grm. and 30 mgrms. respectively. The serum examined with a dark-ground condenser showed myriads of moving particles. The citrated plasma contained mostly separate particles, and not clumps with fibrils attached thereto which characterize a normal citrated plasma. The patient received two intramuscular injections of sup. 36 each of 0.01 grm., and took as much glucose internally as she could. The day following the first injection the vomiting ceased. The patient went to full time, was delivered of a girl, and both made an uneventful recovery.

Case 2. A primigravida aged 23 was much troubled by vomiting. When the urine was examined at the fourth month it was found to contain protein. The proteinuria continued and so did the vomiting, which became pernicious during the seventh month. When I saw the patient for the first time she was vomiting several times a day, and was unable to take anything to eat or drink; in addition she was much troubled with headaches. The urine contained a little protein. The blood-pressure was sub-normal. The examination of the blood revealed similar changes to those mentioned in the former case, except that the suspension stability of the red blood-corpuscles measured 4.5 c.cms. and the percentages of the blood-sugar and blood-urea were 0.112 grm. and 15 mgrms. respectively. The refractive index of the serum registered 1.3490 and the viscosity 8.0 seconds. The patient received ten unit doses of insulin on four successive days. The day following the first injection the vomiting ceased, the headaches vanished and the protein disappeared from the urine. The day after the fourth injection the suspension stability of the red blood-corpuscles measured 3.3 c.cms. The refractive index of the serum read 1.3516 and the viscosity 9.2 seconds. The myriads of protein particles which were seen when the serum was first examined with a dark-ground condenser were replaced by more actively motile particles, giant particles and a few clumps. On the slightest return of the symptoms the injections of insulin were repeated. The patient was delivered at term with no further mishap.

Insulin was prescribed in this case because of its hydrator action. That is to say, insulin causes hydration of normal protein particles, thereby making them conserve their electricity, it restores to the normal state protein particles which are being subjected to dehydration and it brings back to the colloid state protein particles which are passing into true solution.

Case 3. A primigravida aged 20 had an uneventful pregnancy up to the eighth month, when one day she complained of not feeling well. The following day the patient had a rigor and com-

plained of pain in the right thoracic region. The temperature was 104° F., the pulse-rate 120, and the respiration-rate 42. The patient looked extremely ill; she was very blue and had laboured breathing. There was a hard cough but no expectoration. There was a deficient expansion of the whole of the right lung, complete dullness over the entire lower lobe, bronchial breathing and fine crepitations. Diagnosing the condition as pulmonary œdema due to venous thrombosis occasioned by the arrest of the protein particles in the blood in this area, I injected 0.01 grm. sup. 36 intravenously and repeated the injection on the following day, with the result as shown in the chart.



On the fourth day the dullness was much less marked, the bronchial breathing much fainter and the crepitations moist. A few days later the physical signs vanished. Shortly before delivery the patient developed a puffiness of the face and œdema of the ankles. The blood-pressure was not raised, but the urine contained protein and ketone bodies. The suspension stability of the red blood-corpuscles registered 3.5 c.cms. The refractive index of the serum read 1.3495 and the viscosity 8.3 seconds. The percentage of the blood-sugar was 0.086 grm. and of the blood-urea 15 mgrms. The serum was exceptionally clear, and when examined with the dark-ground condenser was found to contain only a few moving particles and a few precipitated clumps. Labour was induced with difficulty and the child died during delivery. One week later the temperature began to rise and fluid to form at the bases of both lungs posteriorly. At this time the suspension stability of the red blood-corpuscles read 5.0 c.cms. The intravenous injections of sup. 36 (0.01 gm.) were made with as good a result as on the first occasion. Two days after the second injection the suspension stability of the red blood-corpuscles registered 4.0 c.cms. The patient made an uneventful recovery.

The Gelato-hydration Toxæmia.

When protein particles go into solution the blood-vessels become thin and hard owing to the water they lose and the mesenchymatous tissue shows evidence of inflammation. The inflammation of the supporting tissue is most marked in the kidneys and the vessels suffering the most damage are the renal capillaries of which the glomeruli form part and the capillaries in the pia-arachnoid, in the grey matter of the cerebral cortex, in the cornu ammonis, the amygdaloid nucleus and the pyriform lobe, structures which are supplied with vessels which come from the pia-arachnoid. These changes lead to a rise in the blood-pressure, degenerative changes in the cells of the choroid plexuses and of the ependyma and to a rise in the pressure of the cerebro-spinal fluid. The protein particles left in the colloid state are apt to become arrested, particularly in the vessels of the structures aforementioned. This leads to a disappearance of the protein from the peripheral circulation, thereby explaining why the protein content of the blood in eclampsia is low. Another sequence is a marked lowering of the osmotic pressure of the plasma proteins, which results in hydræmia, œdema and proteinuria so far as the kidneys are concerned, and convulsions and coma when the brain is involved. The following three cases illustrate this type of toxæmia.

Case 4. A primigravida aged 19 and in the eighth month of her pregnancy went to a hospital complaining of feeling ill.

According to routine the patient's blood was tested, and finding a positive Wassermann reaction two injections of arseno-benzene were made, in spite of there being no clinical evidence or history of syphilis. Two days after the second injection the patient complained of dizziness and vomiting. Later in the day she had a series of fits and became comatose the day following. When I saw her the breath was smelling strongly of acetone and she was in a moribund condition—in fact, she died some hours later. When seen first, the maximum blood-pressure was 118, rising in an hour or two to 150, and still later to 190. The urine was very scanty and contained protein and large quantities of acetone and diacetic acid. The blood was difficult to withdraw and was dark red. The suspension stability of the red blood-corpuscles registered 2.0 c.cms. The refractive index of the serum read 1.3492 and the viscosity 8.4 seconds. The percentages of the blood-sugar and blood-urea were 0.181 grm. and 38 mgrms. respectively. In the serum examined with a dark-ground condenser only a few moving particles could be seen, most of the visible protein was precipitated, and a characteristic feature of the latter was the relatively large proportion of ringed particles. Protein particles take on a slender ringed form when the conversion of others into true solution is pronounced. Just before the patient died the temperature rose to 104°F., as is usually the case.

Post-Mortem. The organs were markedly congested and the cardiac muscle was studded with petechial hæmorrhages. But, the most characteristic lesion was the destruction of the choroid plexuses and the floors of the lateral ventricles. This part of the brain was semi-liquid and considerable softening affected the pons and scattered areas in the cerebral cortex.

A microscopic examination of the organs revealed the following:—

The convoluted tubules of the kidneys are degenerated and fat is to be found at the base of all the epithelial cells. There is some inflammation of the supporting tissue and the glomeruli and capillaries show evidence of interstitial inflammation. Fat is to be found in some of the glomeruli. The liver cells are degenerated and most of them contain fat. No glycogen is demonstrable. There is a lymphocytic infiltration of the portal areas and a peri-cellular invasion of small mononuclear leucocytes.

The muscle fibres of the heart appear to have suffered degeneration and signs of commencing interstitial inflammation are clearly visible. The affected areas of the brain show a lymphocytic infiltration. In the parts most affected there are patches of extravasated blood which have caused a destruction of the cells around them. The picture is typical of an encephalitis which has

terminated in multiple hæmorrhages. The amount of interstitial inflammation is clear evidence of the working of a poison prior to the administration of arseno-benzene. In my opinion the case was probably on the point of developing eclampsia, and the effect of arseno-benzene was to enhance the gelato-hydration already occurring and occasion a foudroyant attack. I am deeply indebted to Mr. Johnstone Abraham for allowing me to investigate this case.

Case 5. A primigravida aged 21 was admitted in the eighth month of pregnancy suffering from severe headaches, vomiting and œdema. The morning following, fits commenced. On examination the maximum blood-pressure registered 190. The urine was scanty and contained protein and hyalo-granular casts. The suspension stability of the red blood-corpuscles read 2.5 c.cms. The refractive index of the serum registered 1.3491 and the viscosity 8.2 seconds. The percentages of the blood-sugar and blood-urea were 0.118 grms. and 15 mgrms. respectively. An ultra-microscopic examination showed few moving particles and not many precipitated particles. After the blood and the cerebro-spinal fluid had been withdrawn, the patient received an intravenous injection of 500.0 c.cms. of a 10 per cent. solution of glucose. Ten units of insulin were injected intramuscularly and the dose repeated in two hours. In addition 500.0 c.cms. of oxygen were injected sub-cutaneously with a Bayeux apparatus.

This treatment was repeated the following day and supplemented by five daily intramuscular injections of 0.001 grm. sup. 468. Sup. 468 is the symmetrical urea of para-benzoyl-para-amino-benzoyl-1-naphthylamine-4-6-8 sodium sulphonate. The patient recovered at once, went to full time, and was delivered of a healthy child. The action of glucose and oxygen is to break up the particles which have become arrested in the capillaries, thereby enabling them to circulate again. Insulin enables these particles to conserve their electricity, and sup. 468 supplies electrons to the particles in virtue of the liberation of the six positively charged conductor sodium atoms.

Case 6. A primigravida aged 28, and at practically full time, was admitted complaining of severe vomiting and headaches. On examination she was found to have œdema of the ankles and a maximum blood-pressure of 210 mms. of Hg. The urine contained a quarter per cent. of protein. Blood was withdrawn for examination, the spinal theca was tapped, 100.0 c.cms. of colloid iodine were injected intravenously, 1000.0 c.cms. of oxygen sub-cutaneously, and three hours later 0.25 grm. contramine intramuscularly, by which time the blood-pressure had fallen to 140 mms. of Hg. The vomiting ceased at once, the patient slept well, and was

delivered of a girl on the following day. The suspension stability of the red blood-corpuscles measured 3.6 c.cms. and the refractive index of the serum 1.3480. The serum examined with a dark-ground condenser showed not a single particle moving, all being precipitated in small grey and non-refractile particles. The Wassermann reaction was positive, though the patient had not had syphilis, and the blood-urea and blood-sugar measured 41 mgrms. and 0.100 grm. per cent. respectively. Two days later the blood was re-examined with the following results: Suspension stability 3.0 c.cms., refractive index 1.3445, blood-urea 71 mgrms. per cent., blood-sugar 0.100 grm. per cent., Wassermann negative and myriads of tiny particles moving. The patient received 20 unit doses of insulin every other day and 0.005 grm. doses of sup. 36 for a fortnight, at the end of which time both the patient and the blood had returned to their normal states. The blood-pressure never rose again and the Wassermann reaction remained negative.

Gelato-hydration may take place in the portal area, in which case the liver and the kidneys are liable to be severely damaged. Acute atrophy of the liver is apt to occur, with or without an accompanying attack of jaundice. The kidneys are subjected to a severe degree of nephritis, which is characterized by proteinuria, oliguria, and œdema. The moment such cases are seen colloid iodine, glucose, or sodium thio-sulphate should be injected intravenously and oxygen sub-cutaneously. It may be wise to repeat the injections on the following day. Two or three hours later either insulin or contramine should be injected intramuscularly. For the next few days, either sup. 36 or sup. 468 should be prescribed. Colloid iodine, glucose and sodium thio-sulphate break up the precipitated particles and restore them to the circulation. Insulin and contramine bring back to the colloid state those particles which are passing into true solution. The symmetrical urea bodies convey electrons to the protein particles. As the last eight cases I have treated in this way have recovered, I venture to think that if no time is lost not a single case of toxæmia gravidarum would end fatally.

The Hydration Toxæmia.

In this type of case the trouble is apt to occur in the early months of pregnancy. The patient complains of headaches and indigestion. There is usually some œdema, and ocular changes are common. The blood-pressure may or may not be raised. The former is the case when the previous trouble caused severe dehydration initially and interstitial nephritis later. Pure hydration from start to finish is accompanied by a low blood-pressure. While the

nephritis met with in eclampsia vanishes when the child is delivered, the type under discussion never clears up. It tends rather to be progressive, therefore the victims should not be allowed to become pregnant again. Treatment is never sufficiently satisfactory to warrant the pregnancy being continued. Consequently, the moment the condition is recognized, induction should be undertaken. The following case illustrates the general features of the condition.

Case 7. A woman when aged 19 contracted syphilis, and at that time presented the clinical condition known as "*Nephritis acuta syphilitica præcox.*" When this condition occurs first the protein in the urine is merely voided lipoid-globulin from the blood, and it is only later when no treatment is prescribed that the parenchymatous cells of the convoluted tubules are liable to become damaged. The patient received no treatment, the proteinuria persisted and she was liable to œdema if she walked or stood on her feet too much. When 32 years of age she became pregnant, but owing to the severe aggravation of the œdema and to the marked proteinuria which occurred the pregnancy was terminated at the fourth month.

In all these cases colloid iodine or glucose should be injected intravenously, oxygen sub-cutaneously, and insulin and sup. 468 intramuscularly. This should be the rule even when labour is induced, owing to the risk of uræmic convulsions occurring after delivery. I have had success with this treatment during the convulsive stage, when only a few ounces of urine were being passed *per diem* and the protein content was such as to make the urine go almost solid on boiling.

The Changes the Blood Undergoes in the Puerperium and the Climacteric.

The type of dehydration which makes itself felt at a later date is the type in which many of the protein particles go into solution. The reason for this is because solution of the protein particles is always accompanied by interstitial changes which affect in the main the small blood-vessels. As the chief clinical manifestation of this type of dehydration is the condition known as "hyperpiesia," we have the explanation as to why an attack of eclampsia in one pregnancy is not apt to be repeated in subsequent pregnancies and why women who have had several children or who have been troubled with subjective symptoms during their pregnancies are liable to develop a high blood-pressure at the climacteric and to die before their time of an arterio-sclerotic lesion. Another very common condition met with at the climacteric is arthritis. This and other climacteric troubles respond

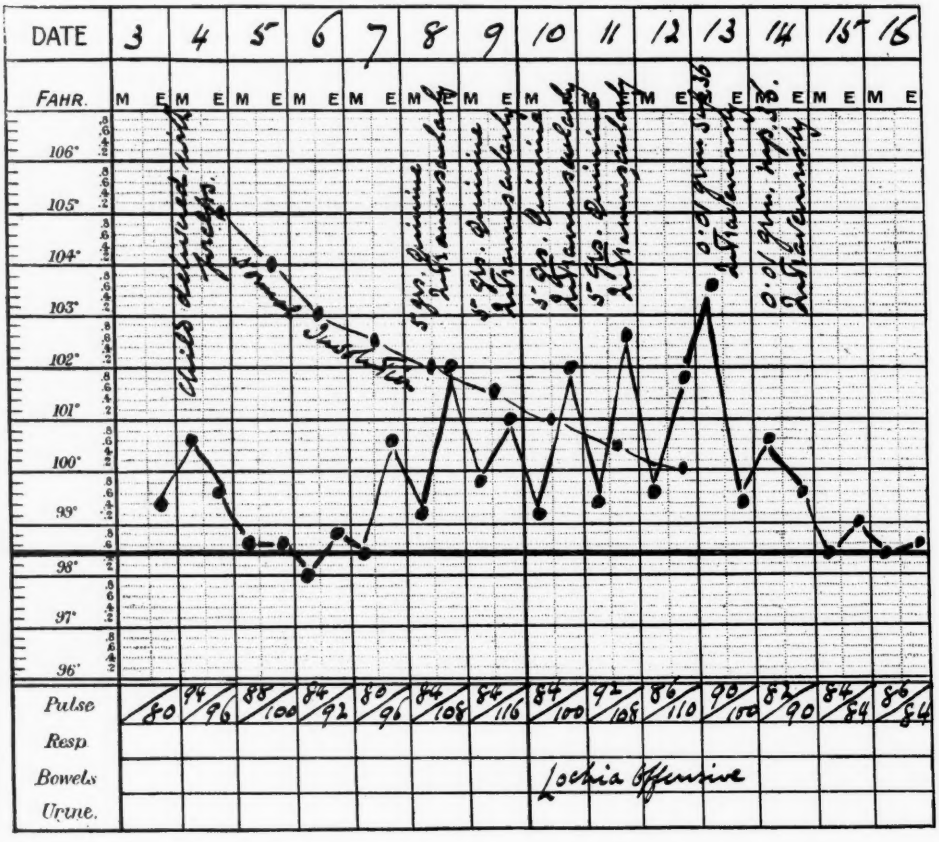
extraordinarily well to thiol-histamine. This drug should be injected intramuscularly on three successive days in 0.002 grm. doses. Those who fail to respond to thiol-histamine may be benefited by contramine, but in the severe cases insulin is called for. Insulin rapidly reduces the blood-pressure and is invaluable in staving off an attack of apoplexy. Even should a hemiplegia have occurred insulin will hasten recovery and restore the patient to more or less her normal condition. Patients whose protein particles are being subjected to dehydration are liable to develop fever and febrile conditions. One of the best illustrations is the frequency with which boils, carbuncles and erysipelas are met with in diabetes mellitus. Similarly many women who have never had boils are liable to develop them during pregnancy. When the protein particles are enormously increased in number and give rise to clinical manifestations, fever is invariably one of these. In most cases of pregnancy the protein particles undergo partial hydration in the later months. After delivery these hydrated particles split up, and it may so happen that at a certain time the protein particles in the plasma are in a state of more or less gelation. This is possibly one of the causes of puerperal fever, because in the less severe cases the suspension stability of the red blood-corpuscles becomes more reduced than was the case before the child was born, and two injections of sup. 36 suffice to clear up the condition.

The following case illustrates the value of sup. 36 in puerperal fever :—

Case 8. A woman was delivered with the forceps. The uterus involuted normally. On the third day the temperature began to rise, and continued to do so till it reached 103.6 on the ninth day. Four intramuscular injections of quinine were administered without any benefit resulting. When sup. 36 was injected an improvement began and was maintained, as shown by the accompanying chart.

The true puerperal septicæmia is probably due to the invasion of a streptococcus into the blood-stream of a patient whose resistance has been considerably lowered by the changes to which the protein particles in the plasma have been subjected.

Though rare, it does sometimes happen that the glycosuria of pregnancy develops in time into diabetes mellitus. This supports my view that diabetes is due to any dehydrator which works over a long period of time. In the end it may happen that the islet cells of Langerhans are destroyed, but the pancreatic lesion is not the *fons et origo mali*. The action of insulin is not specific; it functions by causing hydration of dehydrated particles, whatever be



the cause of the dehydration, a statement which is confirmed in this article.

In streptococcal septicæmia sup. 36 is of no value, and the treatment I have found of most avail is described in the following case.

Case 9. On the third day of the puerperium the patient had a rigor and a sudden sharp rise of temperature. When I saw her the day following I injected 0.1 grm. auramine intravenously, 0.001 grm. sup. 468 intramuscularly and 30.0 c.cms. anti-streptococcic serum sub-cutaneously. These injections were repeated next day. On the third, fourth and fifth days 0.001 grm. sup. 468 was injected alone. The temperature came down slowly and the patient made an uneventful recovery.

The changes the protein particles undergo in pregnancy may become accentuated and produce lesions for the first time in the puerperium. Gelation occurring in the puerperium leads to venous thrombosis. Intracranial gelation causes thrombo-phlebitis and thrombo-sinusitis and gives rise to the clinical condition of hemiplegia. Pulmonary gelation is most apt to be followed by œdema of the lungs, and the clinical condition is frequently diagnosed as pneumonia. If the gelation is particularly severe a block may occur in the pulmonary artery. But, this so-called "embolus" is formed *in situ* and does not originate in the common iliac veins, as is usually thought to be the case. The pulmonary lesions differ in no wise from those encountered after severe operations in elderly patients; indeed, in both the cause is the same—namely, gelation of the protein particles in the plasma, agglutination of the red blood-corpuscles and stagnation of both in the veins. The most common form of venous thrombosis met with in the puerperium is that affecting the veins of the lower extremities. Puerperal thrombosis is particularly common in women who have lost large quantities of blood at delivery. This is because excessive bleeding in a patient whose protein particles have been subjected to some degree of hydration beforehand, leads to an enormous dispersion of the protein particles and markedly reduces the suspension stability of the red blood-corpuscles. Gelation is usually accompanied by a rise of temperature, and in very severe cases the actual venous thrombosis is not infrequently preceded by a sudden attack of diarrhœa, due to the venous congestion of the intestines. If the case is diagnosed early, and 0.01 grm. sup. 36 is injected on two successive days, the lesion vanishes as rapidly as it appeared.

I had a case of a woman who developed acute venous thrombosis of both legs the day following delivery. After the first dose of sup. 36 the pain in the legs vanished and the œdema lessened. By the third day all the symptoms had disappeared. In widespread cases of venous thrombosis glucose or colloid iodine should be injected intravenously and oxygen and insulin sub-cutaneously. Puerperal gelato-hydration may lead to eclampsia and hepatitis and nephritis. But, this physical change, as a rule, is less pronounced after than before delivery. Mild gelato-hydration causing a partial arrest of the protein particles in the cerebral capillaries is apt to occasion neurasthenia, epilepsy and insanity. It is interesting to note that epileptics may be immune from fits during pregnancy. This is because the dehydration of the protein particles occasioned by the pregnancy causes dispersion of the gelato-hydrated particles, the *fons et origo* of the epilepsy. Bromine being negatively charged acts in the same way. In all forms of puerperal insanity much may be done by injecting glucose or colloid iodine intravenously, oxygen

sub-cutaneously, and sup. 36 intramuscularly. A normal individual may have *petit mal* and epileptic fits only when she is pregnant. Indeed, there is no sharp line of demarcation between these and eclampsia. Further, there is no difference between eclampsia, uræmia and the anuric form of diabetic coma. In all the actual trouble is the precipitation of the protein particles in the cerebral capillaries. However high be the percentage of the blood-urea it is not the excess of the urea which causes the convulsions.

SUMMARY.

1. The toxæmias of pregnancy and of the puerperium are due to the physical changes the protein particles in the plasma undergo.

2. The protein particles are subjected to dehydration. When simple, some of the protein particles merely part with their adsorbed constituents (electricity, salts, sugar, amino-nitrogen and fat) and go into true solution. But, when severe their number either increases so much as to occasion gelation or else they increase in size, agglutinate and become precipitated.

3. Gelation in pregnancy is the cause of hyperemesis gravidarum and in the puerperium of venous thrombosis.

4. Gelato-hydration or precipitation is the cause of eclampsia in pregnancy, and in the puerperium of the various forms of cerebral disorientation.

5. Continued dehydration as may result from multiple pregnancies is a cause of climacteric arthritis and hyperpiesia.

6. Gelation may be counteracted by conduction or by hydration. Sup. 36 is the best conductor at present in use, and insulin the best hydrator.

7. Precipitated particles need to be broken up, and when this is achieved they circulate again. The drugs best able to break up gelato-hydrated particles are colloid iodine, glucose, sodium thiosulphate and oxygen.

8. The mesenchymatous changes resulting from long continued dehydration are overcome best by organic preparations of sulphur, such as thiol-histamine, contramine and insulin.

9. The changes the protein particles in the plasma undergo in pregnancy and in the puerperium are not specific. They may be encountered in infections and in other intoxications. Anæsthetics may produce identical changes, and the changes responsible for eclampsia are the same as those causing uræmic and diabetic coma.

A Statistical Enquiry into the Clinical Features of Extra-Uterine Adenomyomata.*

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The communication which I have to make, in conjunction with Dr. K. V. Bailey, is called a clinical and pathological study of extra-uterine adenomyoma.

My part is confined to the clinical aspect, and consists in various tables, which have been compiled after a study of 108 cases which Dr. Dougal and I have collected. These cases were distributed amongst six gynæcologists, namely, Drs. Addis, Clifford, Dougal, Fitzgerald, Fletcher Shaw and myself, and I have in the first place to thank my colleagues very warmly for having allowed me to use their material, and for the trouble they have taken in collecting and tabulating their cases. I am much indebted to Dr. Dougal for his help in analyzing the cases. The number thus collected is not a large one, as we have excluded all cases which have not been operated on, in which there might be some doubt as to the nature of the disease, and also those in which definite notes of certain particulars had not been made. But for these restrictions many more cases might have been included; in fact, the number might have been nearly doubled.

The object of the enquiry was to see if we could get any fresh light on the symptoms and physical signs of this comparatively recently discovered disease.

Extra-uterine Adenomyoma.

1. *Cases.*

108 cases contributed by Drs. Addis, Clifford, Donald, Dougal, Fitzgerald and Fletcher Shaw.

2. *Year of operation.*

1921	.....	1 case
1922	.....	25 cases
1923	.....	35 „
1924	.....	40 „
1925	.....	5 „

* Read at the Fifth British Congress of Obstetrics and Gynæcology, London, April 1925.

3. *Age.*

20—30 years ...	...	16 cases.	Youngest, 23 years.
30—40 years ...	...	46 „	
Above 40 years	...	46 „	Oldest, aged 51 years.

4. *Social State.*

Married	93 cases
Single	15 „

5. *Number of Pregnancies.*

Nulliparæ (single women excluded).....	37 cases=40 per cent.
One child	22 „
Two children	14 „
Three children	9 „
Four childen	10 „
More than four	1 „

6. *Date of Termination of Last Pregnancy.*

(55 *cases.*)

2 years and under	6 cases
2—5 years	7 „
5—7 years	7 „
Over 7 years	35 „

7. *Symptoms.*

(*a*) Menorrhagia	62 cases	=57 per cent.
(*b*) Leucorrhœa	41 „	=38 „
(*c*) Dysmenorrhœa	75 „	=70 „
(*d*) Backache	31 „	=28 „
(*e*) Dyspareunia	30 „	=32 „

(*f*) Other symptoms:—

Pain in lower abdomen	15 cases
Pain in iliac fossa and down one or other leg	5 „
Bearing-down pain	2 „
Rectal pain	6 „
Pain on defæcation	7 „
Dysuria	2 „
Brownish vaginal discharge	1 „
Retention of urine	1 „
Chronic intestinal obstruction	1 „
Discharge per rectum	1 „
Bleeding per rectum	4 „

8. *Physical Signs.*

(*a*) Uterus retroverted or retroposed...	30 cases	= 48 per cent.
(*b*) Uterus fixed	22 „	
(*c*) Nodules in recto-vaginal septum ...	63 „	= 58 „
(*d*) Thickening in appendages	80 „	= 74 „

9. *Condition Found at Operation.*

(*a*) Fibroids	28 cases	= 26 „
(*b*) Polypi	4 „	
(*c*) Chronic metritis	18 „	
(*d*) Tarry cysts	84 „	= 77 „
	Cysts bilateral in 23 cases	
(*e*) Adenomyoma in recto-vaginal space...	68 „	= 63 „
(*f*) Rectum adherent	82 „	= 76 „

10. *Nature of Operation.*

(*a*) Dissection of growth *per abdomen* ..... (Panhysterectomy performed later in 2 of these.)	3 cases	19 per cent.
(*b*) Dissection of growth *per vaginam* ..... (After-history not known.)	1 „	
(*c*) Removal of one ovary	7 „	
(*d*) Removal of both ovaries	8 „	
(*d.l*) Myomectomy. Removal of one ovary and part of other. Round ligament shortening operation	1 „	
(*e*) Supra-vaginal hysterectomy with removal of both appendages	38 „	81 per cent.
(*f*) Panhysterectomy with removal of both appendages	50 „	

11. *Results.*

Mortality: Of the 108 cases, 1 died = a mortality of less than 1 per cent.

Summary.

These figures are found generally to confirm the views that have been previously stated as to the clinical features of extra-uterine adenomyomata, and may be summarized as follows:—

(*Table* 3.) *Age*: These tumours may occur in young women, but are not found after the climacteric.

(*Tables* 5 *and* 6.) *The effects in relation to fertility* are striking. Forty per cent. of the married women had no children or mis-

carriages, and only one patient out of the 108 had more than four pregnancies. Of 55 patients who had been pregnant, the last pregnancy occurred more than seven years prior to the operation in 64 per cent.

(*Table* 7.) *Symptoms*: Dysmenorrhœa was by far the most common symptom. It was mentioned in 70 per cent. Of 47 cases in which the date of the dysmenorrhœa was noted, the symptom was acquired in 26, or 50 per cent.

The other symptoms which were fairly frequent were menorrhagia (57 per cent.), leucorrhœa (38 per cent.), and backache (28 per cent.); but it is probable that these symptoms were often caused by intercurrent troubles and not by adenomyomata. Dyspareunia was present in 32 per cent., but this percentage underestimates the importance of the symptom, as enquiries on the point were not always made. Of 40 cases in which this symptom was specially investigated, complaint was made in 57 per cent. None of the other symptoms were present in a sufficiently large number of cases to make them count as important.

(*Table* 8.) *Physical Signs*: The most important signs were the thickening in the uterine appendages and the discovery of nodules in the recto-vaginal space. The fixation of the uterus was only made out in a comparatively small proportion of the cases; which means that it was only present when the disease was fairly extensive.

(*Table* 9). When we come to enquire into the *conditions found at operation,* we find that tarry cysts occurred in 77 per cent. of the cases, and adenomyoma in the recto-vaginal space in 63 per cent. In many cases these occurred together, but in some cases tarry cysts were found and no cysts in the recto-vaginal space, and occasionally cysts were found behind the uterus but not in the ovaries. The rectum was adherent in 76 per cent. of the cases. This fact seemed to point to the strikingly irritating effect of the growth: it was only in the very early cases that the pouch of Douglas was not showing signs of gradual obliteration.

(*Table* 10.) *Operations*: In 19 per cent. only partial operations were performed, but all of these, except one, involved the opening of the abdomen. In the remaining 81 per cent. of cases the uterus was removed and both appendages, either by supravaginal hysterectomy or by pan-hysterectomy.

Conclusion.

When we come to review the symptoms which have been noted in the table, we find that none of them are sufficiently definite to provide more than a clue to the diagnosis. There is no symptom that is always present, but the accumulation of several symptoms may point to extra-uterine adenomyomata. If the patient has had

no children, or only a few, and if in the latter case some years have elapsed since the last confinement; if she suffers from fairly acute dysmenorrhœa, especially if that has only come on in recent years; and if, in addition, she suffers from dyspareunia, we ought to keep in mind the possibility of adenomyomata.

The diagnosis becomes more probable if certain physical signs are present. If we find definite small, round and very tense nodules in the pouch of Douglas, more or less isolated and very tender, we have little difficulty in recognizing the trouble. If there is resistance at each side of the uterus, and if that organ is retroposed and limited in mobility, and if in addition we can feel a nodular growth between the uterus and rectum, the diagnosis is practically certain. The only condition with which it is likely to be confused is old-standing pelvic inflammation. The distinction, however, is not of practical importance; as a matter of fact, there is a good deal of inflammatory exudation in these cases of pronounced adenomyomata, and in either case an abdominal section is indicated.

Authority and Scepticism in Midwifery and Diseases of Women.

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In olden days we find chapters on midwifery and gynæcology included in the great compilations of Medicine, of which the chief were those of the Greek Hippocrates, dating from about the fourth century before Christ, and of the Roman Galen in the second century of the Christian era. Galen kept a drug-shop in the Via Sacra at Rome, where he was in general medical practice. He rescued the profession of Medicine from the state of chaos into which it had been plunged by the upholders of numerous sects that had sprung up—the Dogmatists, the Empyrics, the Eclectics, the Methodists, and the Pneumatics. His fame was so great and after his time the progress of Medicine so slow that for thirteen hundred years he was quoted by the leaders of the profession as an unassailable authority, to the retardation of research and progress. So late as the year 1559 a Dr. Geynes "was cited before the London College of Physicians for impugning the infallibility of Galen; on his acknowledgment of his error and humble recantations, signed by his own hand, he was received into the College."

By the middle of the seventh century the Roman Empire had fallen and the Arabs under Mohammed had conquered Persia and founded an empire at Bagdad, whence they extended westward. Thus it came about that the seat of culture and learning was transferred from Greece and Rome to the fanatical followers of Mohammed in Arabia, Egypt, and Spain. For the next 600 years following A.D. 630, the year in which the oldest Arabian work on Medicine was published, the Arabs were the most cultured people in the world. The work they did in Medicine consisted almost wholly of translations and copyings from the Greek authors whose works had fallen into their hands. Soon after the end of the twelfth century the power of the Arabs waned; "the day-light of science went down over the nations; and an intellectual darkness, which endured for three hundred years, enveloped the general face of Society."

In the Middle Ages the Renaissance of learning began in Italy

and led to a renewed acquaintance with the writings of Hippocrates and Galen in their original form. In the thirteenth century Roger Bacon, born before his time, studied in the Universities of Oxford and Paris, taught natural science with the help of laboratory and observatory, and began the contest with scholasticism, holding that experiment and observation are of more importance than argument.

At the end of the fifteenth century the discovery of printing began to influence the development of Medicine, and a little later the introduction of woodcuts favoured progress, the latter especially, at a time when dissections of the body were rare. The great voyages of discovery which were made in these times showed the existence of many strange animals and plants unknown to the older peoples, and thus awakened a general interest in Nature study. People began to think more freely and to break away from tradition, the methods of observation and experiment were introduced, and there was a gradual development of the spirit of scepticism which is the fundamental necessity of true science.

In the sixteenth century were published fairly numerous gynæcological writings in which the spirit of progress contended with tradition, with scholasticism, and even with the wildest superstition. Progress began to be made in midwifery and gynæcology with the study of gynæcological anatomy by Vesalius, who was the first to point out that Galen had apparently never seen a human uterus. Colombo, a pupil of Vesalius, rejected the Hippocratic theory of the turning over of the fœtus at the seventh month of gestation, the culbute; and was the first to give a correct description of the attitude and position of the fœtus *in utero*, which he described as forming an ovoid.

In 1513 the first midwives' text-book was printed at Strasburg, "The Rose Garden," by Roesslin. This book is a compilation from old writings from the time of Hippocrates onwards, and treats only of midwifery, but treats it for the first time not as a part of surgery. The book continued to appear in many editions until the eighteenth century, and was translated into Latin, French, English, and Dutch.

Until the middle of the seventeenth century obstetrical and gynæcological cases were in practice attended only by women. Although they wrote about midwifery, men had only a theoretical acquaintance with the subject, and when they were called in consultation did not themselves examine, but had the investigation made by a midwife or family friend of the patient, and thus at second hand gave their opinion and settled the treatment. The first change was made in Paris, at the Hôtel Dieu, in the middle of the seventeenth century, when the midwives who were in charge were prevailed upon to allow surgeons to attend the practice of the

hospitals for the observation of normal labour. Increasing intellectual enlightenment and the recognition that men became more highly skilled in practice as well as science afterwards led to gradual breaking down of the prejudice against male assistance in labour. From Paris the practice of midwifery by men gradually spread to other countries, our own included.

In the seventeenth century great advances were made in Midwifery. William Harvey, the discoverer of the circulation of the blood, opened up new paths by his investigations into the theory of generation and development, the result of his investigations culminating in the principle "omne vivum ex ovo." In accordance with this theory Van Horn considered that the organs hitherto known as testes muliebres contained "ova," and the Dane, Stenson, introduced therefore the name "ovarium." Regner de Graaf observed that the ovaries generated, nourished, and brought to maturity the ova, and that the egg after impregnation is conveyed by the tube into the uterus. In 1677, Ham, of Leyden, demonstrated the spermatozoa. The discovery of the microscope in this century made possible closer investigation into the subject of morbid anatomy, in which a beginning had been made in the preceding century.

In the eighteenth century text-books began frequently to be published in the vulgar tongue. French and English authors used their own language, while Italy continued to employ Latin. Among the English text-books, one by Denman published in 1794 may be specially mentioned. In this work on midwifery were included some chapters on gynæcological diseases, and it contains for the first time the expression "retroflexion of the uterus."

In this century beds and hospitals began to be set apart for Midwifery. In 1745 twenty beds were provided for the purpose at the Middlesex Hospital, and in 1750 and 1752 special hospitals were founded in London—the British, the City of London, and Queen Charlotte's. In 1757 the Dublin Rotunda was founded under the Mastership of Fielding Ould. These hospitals were provided for poor married women and were not much used for clinical instruction. First, in 1765, Leake began to teach at the Westminster Lying-in Hospital, founded specially for the instruction of practitioners in practical midwifery. Hitherto instruction had been given to pupils by practitioners and in private clinics—as, for instance, in those of Osborn and Denman.

Not until nearly another century had elapsed did clinical instruction begin in gynæcology. Kiwisch founded a women's department at Prague in 1842, and August Martin started the gynæcological department in the Berlin Charité in 1858. Then

soon gynæcological clinics spread to all the larger universities of Germany, mostly in association with the already existing midwifery departments. In this country gynæcological clinics for the instruction of students were started in the hospitals of the Medical Schools soon after the middle of the century. In the middle of the nineteenth century also the introduction of anæsthesia and the elucidation of the theory of wound infections inaugurated a new era in Gynæcology, which began rapidly to advance along surgical lines. For a time the complete divorce of gynæcology from midwifery seemed to be threatened, but in the last decade the tendency has been to a reunion of these two branches. In my opinion this is a healthy trend, since they depend upon the same knowledge of anatomy, physiology, development, and surgical principles; and also since they make, when conjoined, a natural and convenient third primary division of the great subject of Medicine.

In my student days instruction in gynæcology, if not deep, was at least broad and various. During one whole summer session I listened to Graily Hewitt's lectures on flexions and versions of the uterus treated in accordance with the mechanical theory for which he claimed the credit. Among his in-patients many notable cures of chlorotic and of over-worked and under-fed young women took place with the help of the knee-elbow position or a cradle pessary and of a nutritious diet with added cream. In the out-patient room at the same hospital Dr. (now Sir) John Williams poured scorn on the theory that a light little body like the uterus could possibly cause symptoms by twisting or turning about in its place. His patients appeared to do well on simple tonics with Bromide for pain or Sulphate of Magnesia for constipation and without much local treatment. Under his teaching a student at least acquired a robust spirit of scepticism. At Dublin Rotunda, Dr. Lombe Atthill on one or two mornings of the week treated each of a string of patients by applications to the cervix of carbolic acid or iodized carbol, and I do not remember seeing him treat a gynæcological case in any other way. A little later—in 1884 to be exact—a distinguished physician made a scathing attack on the gynæcologists as he then saw them.[1] In describing the misfortunes of a neuralgic woman who consulted gynæcologists or specialists for nervous diseases he wrote: "However bitter and repeated may be her visceral neuralgias, she is either told she is hysterical or that it is all uterus. In the first case she is comparatively fortunate, for she is only slighted; in the second case she is entangled in the net of the gynæcologist, who finds her uterus, like her nose, is a little on one side, or again like that organ, is running a little, or it is flabby as her biceps, so that the unhappy viscus is impaled upon a stem, or perched upon a prop, or is painted with carbolic acid

every week in the year except during the long vacation when the gynæcologist is grouse-shooting, or salmon-catching, or leading the fashion in the Upper Engadine. Her mind is thus fastened to a more or less nasty mystery, becomes newly apprehensive and physically introspective, and the morbid chains are rivetted more strongly than ever. Arraign the uterus, and you fix in the woman the arrow of hypochondria, it may be for life."

A few years later I had the advantage for a time of watching Lawson Tait's operative work, and thus of witnessing almost the very beginning of the advance that made possible gynæcology as we now know it. As skill in abdominal and pelvic operations grew and spread abundant opportunities were provided for the study of the morbid anatomy and histology of the female generative organs and of the relationship between pelvic lesions and the rest of the economy. Before that time a fair amount of work had been done on ovarian cysts and tumours; since then exhaustive studies have been made on these tumours, on uterine fibroids, on pelvic inflammations, and extra-uterine gestations. Chorion-epithelioma has been thoroughly investigated, and now the pathology of the interesting group of cases known under the term endometrioma and associated with the origin of tarry cysts of the ovary is in a fair way to be finally settled.

A flood of light has been thrown on our speciality, but still in many directions, and perhaps now more especially in some of the more elementary and fundamental parts of our speciality, those that deal with the commonest and possibly less interesting disabilities of women, there is abundant room for thought and further research. For a long time the pathology of the female generative organs was considered special and peculiar to itself and differing from that of the other organs of the body; naturally this led to many erroneous and imperfect conclusions, and to this day it does not appear that sufficient care has been taken to follow the general principles of pathology and to employ them as far as they are applicable to gynæcology. It is a truism that correct diagnosis must depend on a correct appreciation of the pathological condition from which the patient is suffering. Too often the invention of a Greek name for a symptom appears to have led to the erroneous impression that the Greek name implied a diagnosis. The term Dysmenorrhœa, for example, has an impressive sound, but it connotes nothing more than the patient herself has told us. On us lies the duty to find out the pathological condition from which the symptom takes origin. Often it depends on faulty hygienic or other general conditions. Among local conditions the cause of dysmenorrhœa may be found in organic changes in some part of the genital tract, in inflammations, new growths, or dis-

placements; or it may be found in some developmental abnormality. Under this last heading singularly little importance appears to be ascribed to narrowing, congenital or acquired, of the internal os, with consequent obstruction to the out-flow of menstrual or other discharges. The uterus is a hollow muscular organ with an excretory duct, the cervix, whose canal is narrowest at the two extremities. That there is a functioning sphincter at the internal os is well-known to every one who has dilated the cervix with Hegar's dilators. When the abdomen is opened the upper part of the living cervix can be felt between the fingers and thumb, and usually gives the impression of a special band of muscle surrounding its upper part at about the level of the internal os, and reminding one of an india-rubber ring. By the use of laminaria tents some idea of the degree and extent of any narrowing of the internal os is obtained; in cases of spasmodic dysmenorrhœa these show not uncommonly that there is marked narrowing, usually in the form of a ring, but sometimes extending as a narrow canal or isthmus up to as much as half an inch in length.

Now the examination of a case of dysmenorrhœa takes place at a given time, and the condition found is quite likely to be merely a stage in a process that may be continued over a very long period. In the case of other hollow muscular organs—the heart, the stomach, intestine, bladder, ureter—wherever there is a narrowing of the lumen the muscular wall above the obstruction becomes hypertrophied, and if the condition persists dilatation supervenes in due course. So in the case of the uterus where there is an undue degree of narrowing at the internal os, hypertrophy of the muscular coat will ensue. I have seen many cases of severe spasmodic dysmenorrhœa in which the laminaria tent has given definite evidence of narrowing at the internal os; in young girls it is not possible to determine whether the body of the uterus is hypertrophied in such cases, but in some nulliparæ seen later in the twenties I have observed that the body of the uterus is definitely hypertrophied; it feels spherical and enlarged on bimanual examination and the sound passes $3\frac{1}{2}$ inches or thereabouts. At a still later age nearing the climacteric a small number of nulliparous patients suffer from severe menorrhagia, have large and somewhat tender uteri, are diagnosed as cases of chronic metritis, and have sometimes to be subjected to radical operation; in such cases Fletcher Shaw has shown that the appearances are those of hypertrophy of both muscular and fibrous constituents of the uterine wall. Finally, when the patient has passed the menopause such a uterus may intelligibly become a pyometra because of the narrowing of the outlet and the senile wasting and weakening of the muscular wall. I have not recognized a case of pyometra

belonging to this series, although such cases probably occur. The usual cases of pyometra arise after the menopause, most commonly in obstruction by cancer of the cervix or body of the uterus, less commonly in acquired stenosis of the internal os; always in thin-walled and atonic uteri.

Regard for the authority of the eminent sceptics who ruled obstetrics in the seventies and eighties of last century explains, in my opinion, why it is that the application of well-known principles of general pathology to the uterus as here outlined has not yet received general recognition by gynæcologists. Tardiness such as this may be balanced by an undue readiness to accord exaggerated or at least premature importance to a new and imperfectly worked out theory.

The beginning of the application of the theory of the internal secretions to Medicine held a lesson of this kind that was certainly not learned by us as a profession if we may judge from recent widespread dabbling in this region of therapy. When the action of the thyroid had been investigated and largely put on a firm basis, it was discovered that the ovaries also acted by means of an internal secretion. Two eminent practitioners, each with six cases of hysterectomy for fibroids, all done within twelve months, hastened to publish a claim that the preservation of an ovary had remarkable effects on the welfare of the patients. The great majority of gynæcologists, without further ado, followed their example and plumed themselves on the fact that they also always saved an ovary or at least part of one when they could. In consequence of this hasty and impulsive action it was many years before the real scientific facts of the case began to be apparent. It is now fairly well established that the artificial menopause is worst when the ovaries alone are removed, better when the uterus and its appendages are completely removed, best for the time being in cases in which the ovaries or part of them are preserved. In the last group of cases, however, menopause symptoms come on, often severely, at an interval of two or three years after the operation. Speaking broadly, the general condition of the patients who have had the total operation is much better than that of the others at the end of two years. An extensive and laborious investigation on my cases by Dr. Beatrice Webb showed that the sexual life of the patient was impaired little or not at all by the complete operation. A further result of these investigations rather surprised us at the time, but proved to be in accordance with later developments of the theory of internal secretions. The younger the patient the less was she found to suffer from menopause symptoms, the balance of the remaining internal secretory organs being more easily regained. The patients who complain most of the menopause

symptoms are those between the ages of 40 and 50 at or near the natural menopause.

In our own generation the progress of Medicine in all its branches has been greater, more rapid, and in more various directions than ever before possible, and it has been correspondingly harder to preserve a steady mind and measured judgment. In the panorama of Medicine spread before us in the medical journals and periodicals it is often difficult to see the wood for the trees. The proper teaching and practice of midwifery and gynæcology calls for a wide knowledge of the general principles of medicine, surgery, and pathology, and the application of this knowledge to the cases met with in the speciality. In this is to be found a strong argument against what I may be permitted to call premature and mere specialism. The impossibility of teaching all who aspire to become sound practitioners more than the broad general principles on which our knowledge is founded increases the difficulty of spreading true and up-to-date knowledge in a special branch.

The tendency of modern methods of examination and their influence on education is to squeeze all but the very few into one common mould; to destroy the power of rational thought, and thus to hinder the spread of true knowledge. The importance of authority is apt to be exaggerated, and the introduction into general use of new truths and methods unduly retarded. The student who is taught to think and reason, to apply general principles as far as they will go, is likely to make a far better practitioner and citizen than one whose memory is crammed for the time full of miscellaneous and disconnected facts, ill-digested and half-understood, and only reproducible in parrot-fashion.

Examiners are usually chosen from among older men, and consequently often have formed opinions fixed and unalterable. An examiner should constantly be on his guard so as not unduly to press his personal peculiarities and predilections. No doubt examinations are the best means hitherto devised to protect the public and ourselves against charlatanism and quackery, but they have a serious tendency to contract the area of vision of both examiner and examinee. The student and his teacher naturally study the idiosyncrasies, if any, of the examiners and prepare to meet them. Similarly text-books written primarily for students have to be written with one eye always on examinations, and so we find a certain uniformity, a want of elasticity that leads to failure to reflect fairly progress that has been made. There is a dangerous readiness to believe all we read, and all we are told by certain teachers; this tendency unduly to look up to authority is inculcated at school and consolidated by our training, and especially by

the usual methods of examination. It is necessary continually to strive against the narrowing influences of text-books and examinations, to keep alive the spirit of scepticism, and to call upon authority for proofs.

The constant recurrence in text-books and writings of the term "a pair of volsellum forceps," led me to consult a Latin dictionary, where I found that the word "vulsella" or "volsella," a noun of the first declension, means a forceps, a kind of pincers. It would appear that sometime or other a teacher with the Latin of a fourth form schoolboy must have mistaken the word for the plural of a neuter noun ending in "um," and some pleonastic successor in search of a higher-sounding title for his instrument tacked on the other three words, thus triumphantly employing four words in place of one that is correct and sufficient; and the term so full of sound and pregnant with meaning has since been sedulously copied by author after author.

In describing the action of the uterus in labour the term inertia is applied by most teachers and text-books to two totally different and contrasted conditions. Primary inertia is used to designate the action of a uterus in labour slow from the first and ineffective, the work of a lazy or, better perhaps, sluggish uterus. The term secondary inertia is an insult to a uterus which has tried hard to overcome its difficulties and after prolonged efforts has become tired and exhausted. Surely the term uterine inertia should be banished and replaced by words more accurately descriptive of these two opposite conditions.

In the discussion of obstructed labour the term tonic contraction is used merely to conceal our ignorance. As a natural result in obstructed labour the two portions of the uterus, the upper contracting part and the lower dilating zone and cervix, become abnormally contrasted with each other, and the condition that should always be described as *excessive uterine retraction* develops and, if not well treated, leads to rupture. Intermittent pains can be distinguished by abdominal palpation and may continue right up to the moment of rupture. To this condition the term tonic contraction is usually but wrongly applied. The term tonic contraction means, if it means anything, that the uterus has entered into one long continuous contraction, showing no intermissions. This state is also met with in obstructed labour, and may come on at any time after the membranes have ruptured, even early in the first stage; usually it is caused by ergot or by rough and repeated examinations or ineffectual attempts at delivery. Labour comes to a standstill and the condition leads to death from exhaustion or sepsis. The uterus does not rupture spontaneously, though it may easily be ruptured by the accoucheur in his attempts at

delivery. The term tonic contraction should be reserved for this condition, and should not be applied indiscriminately and loosely to well-differentiated processes.

The large and confused group of cases jumbled together under the term prolapse of the uterus forms one of the least satisfactory groups of diseases of women from the standpoint of the student and practitioner, and is not adequately treated in the text-books. The term itself reminds one of the definition by the French savants of a lobster, as a red fish that walks backwards—a definition that Cuvier is said to have assured them was correct, except that a lobster is not a fish, is not red, and does not walk backwards. Similarly, in the cases called prolapse of the uterus, the parts do not merely "fall down," but are expressed; and the uterus is by no means the only or even the chief constituent of the lesion. In a wide circle the term affords as much satisfaction, or more, than the blessed word Mesopotamia. It is common for women who become conscious of some unusual pelvic sensation to go to the doctor with a ready-made diagnosis that the "womb is down." This lends itself to easy translation into prolapse of the uterus and to as obvious treatment by the insertion into the vagina of a soft rubber ring or other abomination. As the result of such a series of events one has found the ring pessary applied in cases of extra-uterine gestation, salpingitis, cancer of the cervix, gonorrhœal cervicitis, vaginitis, and indeed in practically every affection of the pelvic organs in women.

The conditions jumbled together under the term uterine prolapse are cases of hernia, comparable in their origin and effects with hernia at other weak parts of the abdominal wall. When considered as a hernia with neck, coverings, sac, and contents, the changes in the extruded parts become easily understood; the thickening of cervix and vaginal wall near the apex, the general enlargement and elongation of the whole uterus in old standing cases, for two generations erroneously considered to be due to stretching of the supra-vaginal cervix; and the characteristic ulcer that forms in neglected cases.

Among the contents of every prolapse to which the bladder contributes it is strangely overlooked that the cystocele includes the trigonum and the lower end of the ureters, and that the latter are obstructed by stretching and by the pressure of the neck of the utero-vaginal hernia.[2] Forty years ago Ch. Féré published an account of six autopsies on cases of prolapse in women from 63 to 91 years of age. In all six there was a cystocele with dilatation of the pelves and calyces of the kidneys. In five of the six cases there was also inflammation affecting the bladder, ureters, pelves, and calyces of the kidneys, and the kidneys were themselves the

seat of multiple miliary abscesses. In one case only was there no inflammation, and in it the kidneys were dilated and had a thinned and pale cortex—a condition of hydronephrosis. Féré adds that he has several times seen uræmic disturbances which disappeared after the reduction of a prolapse. It follows that prolapse frequently gives rise to alterations of the urinary tract and that these may eventually be fatal.

It is to be borne in mind that each case of prolapse as seen is merely a stage of a process that continues for years or for the whole of life, and that the earlier treatment is begun the easier and more effective is it likely to be. Most cases would be entirely prevented by efficient immediate suturing of the torn perineal body at the conclusion of labour. In those commencing in the puerperium appropriate treatment should be instituted at once. In established cases well-planned plastic operations are required. In my opinion pessaries should be entirely banned, in spite of the sanction of the opinion and practice of more than 2000 years. Pessaries merely keep the prolapsed part out of sight for a time, while as a rule by setting up stinking discharges and inflammations, with consequent injury to the supporting tissues of the uterus, they help to hasten the prolapse on its downward course. Only in exceptional cases in very old or decrepit women should pessaries be allowed a place. They have long outlived their usefulness, and it would be a great gain to all the subjects of prolapse if in all other cases than those just mentioned pessaries were thrown on the rubbish heap, to which they properly belong.

The progress of Medicine and of its three main divisions—Medicine, Surgery, and Midwifery and Gynæcology—is bound up with the general progress of learning. When intellectual activity is great Medicine advances along with all the other arts and sciences and takes toll from them all. When the lamp of learning burns low Medicine sinks to a dark plane. In the last two generations human knowledge has advanced by leaps and bounds and scientific Medicine has made enormous strides. But the science is not exact, and we are far indeed from reducing its phenomena to strict mathematical demonstration. In the meantime the struggle goes merrily on between authority and the scepticism that forms the true foundation of the Science and Art of Medicine.

1. Clifford Allbutt. Gulstonian Lectures on Neuroses of the Viscera. *Lancet*, vol. 1, 1884, p. 459.
2. Ch. Féré. Le Progrès Médical, vol, xii, 1884, p. 22.

A Case of Endometrioma of the Umbilicus.

By Henry Russell Andrews, M.D., B.S. (Lond.), F.R.C.P.,
Senior Obstetric Physician to the London Hospital.

Since attention has been so much drawn to the presence of endometrial tissue in the ovary and pelvic peritoneum cases have been described in which endometrium has been found in other ectopic situations. A. C. Palmer has described three cases in which he found endometrial tissue in the skin of the perineum. So far I have seen no account of endometrioma of the umbilicus, and think that the description of such a case may be of interest. In March, 1925, when I was operating at the Ilford Emergency Hospital, I was asked to see a patient who complained of bleeding from the umbilicus at her menstrual periods. I examined her umbilicus and found a condition which I had not seen before, not an umbilical polypus, but two purplish lumps the size of small peas from which dark blood was oozing. She was menstruating at the time. I said that the condition looked like an endometrioma, and that if it was one I ought to find a tender fixed mass in the pelvis. On bimanual examination both ovaries appeared to be normal, but in the pouch of Douglas there was a fixed tender mass, hard and apparently solid in consistence, about the size of the top-joint of my thumb.

She was admitted into the London Hospital a few weeks later for operation. She was 41 years old, had been married nine years, and had had no children or miscarriages. For the last three years her menstrual periods had been profuse and painful, the pain being chiefly in the right iliac fossa and going up to the umbilical region. She had been curetted in 1923 with no benefit. Since December, 1924, there had been some hæmorrhage from the umbilicus during the menstrual periods, and she thought that the occurrence of this bleeding relieved the pain to some extent.

I removed the umbilicus and then opened the abdomen. The uterus and ovaries were normal. Deeply situated in the pouch of Douglas was a nodule the size of a small walnut. I removed this as completely as I could, but chose to leave a thin layer on the anterior wall of the rectum rather than risk opening the bowel. The urachus showed nothing abnormal. The patient made an uninterrupted recovery and reported in June that she had had no pain or excessive bleeding since the operation. The Pathological Department reported that there were fragments of ectopic endometrium in unstriped muscle and fibrous tissue from the pouch of Douglas, and slight hæmorrhage in ectopic endometrium in the subcutaneous tissue of the umbilicus.

Abdominal Pregnancy, secondary to Tubal Gestation at Term, with Notes of a Case.*

By J. A. Kynoch, C.M. (Edin.), F.R.C.S. (Edin.), F.R.C.P. (Edin.),

Professor of Obstetrics and Gynæcology, St. Andrews University.

Mrs. T., aged 37, was seen by the House Surgeon of the Out-door Department of the Dundee Maternity Hospital on the 5th of March, 1925. The history was that on the previous day, thinking she was in labour, the patient left her house with the intention of going to the Maternity, but fainted on the way and returned home. On a message being sent for assistance a nurse from the Hospital found the patient somewhat collapsed, with very rapid breathing and not in labour. The case was reported to the House Surgeon, who, on visiting the patient, found her looking very ill, sick and vomiting; temperature 102°, and pulse-rate 112. She complained of abdominal pain, but did not seem to be in labour. He sent her into Hospital, where I saw her soon after admission. It was obvious that this was not a normal case. It was very difficult to get a coherent history from the patient, but I subsequently ascertained that she had a child 19 years ago, labour being normal. Her health since then had been fairly good, and she was able to follow her usual occupation as a Mill Worker. Her last menstruation was in April, 1924, and she was seen by her doctor two months later, as she was uncertain of her condition. She was told that she was pregnant, but did not seem to require any special treatment. She first presented herself at the Antenatal Department of the Hospital in October in order to arrange for her confinement. She was then supposed to be about five months pregnant, and was told to report herself later, but failed to do so. She expected to be confined about the end of January. At the beginning of the year she was seen by a nurse on account of abdominal pain and slight uterine hæmorrhage, but it was not thought necessary to send her into Hospital. The patient stated that fœtal movements ceased at this date.

On admission to hospital I found the patient's condition very serious; pulse-rate 120, temperature 102°. She looked exhausted

* Read at a meeting of the Edinburgh Obstetrical Society, June 10th, 1925.

Condition as found at operation.

and was somewhat jaundiced. The abdomen corresponded in size to a full-time pregnancy, circumference at the umbilicus 36 in. No fœtal parts could be felt, nor heart sounds heard, and the percussion note was tympanitic all over the abdomen. On bimanual examination, without an anæsthetic, what was supposed to be the fundus of the uterus was felt to the right and slightly above the symphysis pubis. The external os was somewhat patulous, but did not admit the finger. Immediately behind and depressing the posterior fornix there was felt a doughy swelling. As the patient was obviously pregnant with the uterus empty, the condition was diagnosed as one of abdominal pregnancy with infection of the sac. The patient being very ill and in a septic condition, I decided to operate without delay. With the assistance of my House Surgeon, Dr. Blair, I opened the abdomen by the usual median incision and cut through a very much thickened peritoneal layer, immediately below which I incised the sac densely adherent to the parietal peritoneum. On opening the sac there was a forcible escape of fœtid gas, followed by about two pints of chocolate-coloured fluid. Then there was exposed the thigh of a mature fœtus, in the attitude of extension, the head being above the umbilicus, and the breech occupying the left pelvic region. This evidently explained the doughy swelling felt through the posterior fornix before operation. The cord was ligatured at the level of the incision and the placenta appeared to be attached to the right lower third of the wall of the sac and posterior layer of the right broad ligament. The placenta was easily peeled off, there being comparatively little hæmorrhage from the area of detachment. After the sac was thoroughly irrigated with saline, the uterus was found to be slightly enlarged, flattened from before backwards and directed to the right side. The left Fallopian tube, ovary and broad ligament appeared to be quite normal, the right Fallopian tube likewise was normal in its inner two-thirds, but the right ovary and the outer part of the Fallopian tube could not be inspected on account of dense omental adhesions. The whole of the inner surface of the sac was lined by a thick sloughing membrane, through which, at its upper part, intestinal coils could be traced. Attempts to remove the sac proved futile, on account of its firm adhesions to the peritoneum. The sac was plugged with a Miculicz tampon, and the edge sutured to that of the abdominal wound. This was removed 48 hours afterwards and the cavity subsequently irrigated with a weak solution of hydrogen peroxide. Towards the end of the operation the patient, being somewhat collapsed, received two pints of intravenous saline. During convalescence a considerable portion of the sac came away in sloughs, but otherwise the patient made an uneventful recovery,

and left hospital six weeks after operation. The fœtus was a well-developed male, showing evidence of commencing maceration. It measured 20 inches, weighed over five pounds, placenta one pound, the nails on digits and toes were fully developed, and there was abundant hair upon the scalp.

It may, I think, be assumed that the primary implantation of the ovum was in the right Fallopian tube, and the ovum, by gradual erosion of the upper wall, had passed with unruptured membranes into the abdominal cavity. The conditions revealed at the operation do not allow the assumption of an intra-ligamentary development. "Spurious" labour may have occurred one month before the confinement was expected, as at that time fœtal movements were said to have ceased, and there was a history of abdominal pain and slight hæmorrhage from the uterus. Infection of the sac had taken place some time after this. It is of interest, however, to note that the fœtus was in a wonderful state of preservation, there being only a slight appearance of desquamation on the back. It is further of interest to note that at no period during the whole course of pregnancy was there any acute pain or sudden illness beyond the fainting attack on the patient's way to the hospital. The treatment in this case was comparatively simple, the separation of the thrombosed placenta being easy and followed by only slight hæmorrhage. In the treatment of advanced ectopic pregnancy the most important point is the management of the placenta, and this depends on whether the child is alive and viable or dead. There is still some difference of opinion as to the value of an ectopic fœtus. Some years ago Winckel published a work on the ectopic fœtus, in which he states that 50 per cent. were malformed, and of those born alive half died within the first month. Olshausen published a case in which both mother and child were alive at the end of a year. Harris, of Philadelphia, tabulated 77 cases of viable fœtus delivered by abdominal section, and in only one case (that of Olshausen already referred to) were both mother and child alive and well a year after operation. The most complete work on advanced ectopic pregnancy is that of Sittner, who recorded and tabulated 126 cases in the "*Archiv. für Gynäkologie*" (1901), and later supplemented the list by 16 cases published in the "*Centralbl. für Gynäkologie.*" Of the 126 cases, only in nine were mother and child alive at the end of a year.

Those who consider the fœtus of secondary importance recommend delaying the operation till some time after its death so as to permit of the separation of the placenta with a minimum of hæmorrhage. It may here be noted that several cases have been reported of normal pregnancies following a previous operation for

advanced tubal pregnancy, which fact might influence some in favour of delay in the interest of the mother. But, on the other hand, if the fœtus is alive operation may be postponed till it reaches maturity, provided the mother is placed under such conditions that immediate operation can be performed should this become necessary.

Although the mother must always be the first consideration, deliberately to sacrifice the life of a child is unjustifiable, so that it is desirable to adopt some method in the separation of the living placenta whereby the life of both mother and child may be saved. When the living placenta is attached chiefly to the uterus and broad ligament, the ovarian and uterine arteries can be ligatured, with hysterectomy if necessary, which will permit of separation of the placenta with the minimum of hæmorrhage; but if the attachment is chiefly to bowel or mesentery, ligature of the vessels being very difficult, it is probably safer to rely on thorough plugging with thick bismuth gauze, placing a large pad over the abdomen with a tight abdominal binder, and to anticipate subsequent discharge of the placenta in fragments.

Sittner, in his work, reports that in 15 cases in which the blood-vessels were secured before separation of the placenta the mortality was 6 per cent., while in 15 cases in which there was no attempt to tie the vessels first the mortality was 46 per cent., showing that the ideal method is to ligature or clamp the blood-vessels before attempting to separate the placenta. This is now the recognized practice, and encouraging results have been reported in recent years.

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Normal Labour after removal of 23 Fibroids by Myomectomy.

By William Fletcher Shaw, M.D., Ch.B. (Victoria),
Professor of Obstetrics and Gynæcology, Manchester University;
Hon. Assist. Gynæc. Surgeon, Manchester Royal Infirmary;
Hon. Surgeon for Women, St. Mary's Hospitals, Manchester.

I was asked to see Mrs. H., aged 40, in June, 1919, by her doctor because she had been in labour for two days and no progress was being made. She was seven months pregnant, was having regular labour pains, and her pelvis was filled with a fibroid tumour, as large as a fœtal head, which prevented the child engaging in the pelvis. Other fibroids could also be felt in other parts of the uterus. I took the patient into St. Mary's Hospital and delivered a dead child by a Cæsarean section. As this was the first pregnancy, and the patient was very anxious to have a living child, I decided to remove the fibroid tumours by myomectomy, though there were so many I was very doubtful if I should be able to do this and leave a useful uterus.

In addition to the fibroid in the lower uterine segment, the size of a fœtal head, I removed 22 others, though several of these were quite small. Although I removed as many as possible through each incision, the uterus was scarred all over at the end of the operation, and I was doubtful whether I was justified in leaving this organ behind. I closed all the incisions with catgut sutures, and the patient made an uninterrupted recovery.

Four years later Mrs. H. consulted me, as she thought she was again pregnant. There were no fibroid tumours to be felt in the uterus, and I advised that the pregnancy should be allowed to continue, although feeling anxious about the strength of the scars on the wall of the uterus. I took the patient into St. Mary's Hospital a short time before labour was due, and kept her under observation.

The labour was uneventful. The cervix dilated quite easily, and a there was no sign of rupture or impending rupture of any of the scars, interference was not attempted until the head was on the perinæum, when it was helped through with the low forceps.

The patient made an uninterrupted recovery.

A Band, formed from an obliterated Artery, stretching from the Mesentery of the Ileum to the Abdominal Wall and transfixing the Omentum.

By William Fletcher Shaw, M.D., Ch.B. (Vict.),

Professor of Obstetrics and Gynæcology, Manchester University; Hon. Assist. Gynæc. Surgeon, Manchester Royal Infirmary; Hon. Surgeon for Women, St. Mary's Hospitals, Manchester.

Mrs. B., 43 years of age, consulted me chiefly on account of hæmorrhage, which had steadily increased for some years, but in addition to this she complained of chronic aching pain in the right iliac region, which, she said, had been present as long as she could remember right back into childhood, and which never improved or increased, but seemed to be always present.

She had a large fibroid polypus in the vagina, and in addition the uterus was enlarged by several other fibroids, almost up to the umbilicus.

I removed the fibroid polypus, cleansed the vagina, and then opened the abdomen, preparatory to performing panhysterectomy. When I opened the abdomen in the middle line I found the omentum stretched over the whole of the lower part of the abdomen and fixed in the right iliac region by means of a band, the thickness of a piece of twine, which transfixed it some two inches from its free border, and so anchored it down in the lower part of the abdomen. Otherwise, the omentum was quite free from adhesions, and slipped up into its normal position when the band was incised.

This band sprang from the mesentery of the ileum about half an inch from the intestinal border at the level, and on the left side of, the third lumbar vertebra and ran across to the anterior abdominal wall, where it was lost in the tissues about the right inguinal ring.

The band was quite free from adhesions, fairly tense, and transfixed the omentum without being in any way adherent to it, just giving the appearance of a piece of string which had been threaded through the omentum.

I tied both ends of the cord and excised the middle portion. This allowed the omentum to slip back into the upper part of the abdomen, after which I removed the whole of the uterus.

I am indebted to Prof. Stopford, Professor of Anatomy at the Manchester University, for kindly examining this piece of cord which I removed.

Microscopical section shows it to consist of loose reticular tissue surrounding a large artery, several veins and some nerve fibres, and the whole to be enclosed by a layer of peritonæum.

I cannot find reference in the literature to any band of this description, but it is evidently the remains of some vestigial structure and probably transfixed the omentum at an early stage of development, and so the patient's omentum has been fixed down in the iliac region during the whole of her life, and given rise to the chronic aching pain of which she complained.

Case A. (Seen by Dr. MacCallum.) Field showing a typical nuclear figure.

A solid Malignant Tumour of the Ovary in a girl of 15 years old associated with Pregnancy.

By V. B. Green Armytage, M.D., M.R.C.P.,

Second Professor of Gynæcology, Calcutta Medical College, and Second Surgeon to the Eden Hospital for Women, Calcutta.

I think the following case is worthy of publication. Towards the end of July, 1924, a Nepali lady, aged 15, married 15 months, was brought down to Calcutta from Khatmandu. The history was that she had ceased to menstruate on the 25th of February, and it was considered that she was pregnant. On the 4th of July she complained of intense swelling of the legs, vulva, and abdomen; indeed, so great became the swelling that her local medical attendants had to drain the labia with Southey's tubes, and tap the abdomen of 190 ounces of yellowish clear fluid. After tapping, two distinct tumours could be made out apparently rising out of the pelvis. One week after tapping, the abdomen again became immensely distended with fluid, the whole abdominal wall being also œdematous. She was then hurried down to Calcutta. After a second tapping I saw her, and was able to detect fœtal heart sounds over one tumour; the other tumour I suspected to be a papilliferous cyst of the ovary. The aspirated fluid showed: Albumin, .5 per cent.; fibrin, *nil;* sugar, .04 per cent.; urea, .03 per cent.; leucocytes, *nil;* R.B.C., present. The blood report was: R.B.C., 3¼ million; W.B.C., 8,000. I advised immediate operation, and the next day opened the abdomen. The abdomen contained a great deal of free clear reddish fluid; there was a large solid tumour the size of a cottage loaf on the right side, quite free and with no adhesions whatever; the capsule of the tumour had burst in two places and the tumour was twisted on its pedicle; and the colour of the tumour was deep purple. Without handling the pregnant uterus, the tumour was very easily removed and the stump buried. The left ovary was perfectly normal, with a visible corpus luteum. There was no evidences of metastases. The abdomen was closed in layers as usual. The immediate history and recovery of the patient were uneventful. She healed by first intention and was walking about on the twenty-fifth day. But although she seemed to be well and there was no recurrence of fluid, I did not feel altogether happy about her, for her pulse-rate was unduly rapid and she appeared to become more

anæmic and thin as the months passed. Two and a half months after operation she suddenly became cyanosed and dyspnœic, the abdomen as suddenly filled up with fluid, labour started, and she delivered herself of a dead healthy fœtus of 36 weeks. The distension of the abdomen went on increasing until tapping had to be done to relieve the distress; six pints were removed by the physician in charge, but a few hours later she died. Professor W. G. MacCallum of Johns Hopkins University, happened to be here at the time of the operation, and I am grateful to him and Prof. Shanks, of Calcutta University, for their report of the tumour and the enclosed microphotograph. ". . . Section shows marked glandular-celled growth. In areas the lumina are surrounded by several layers of cells, in others there are only solid masses of cells in which occasional mitolic figures are present. . . . Many lumina contain masses of desquamated epithelial cells, . . . the stroma shows scattered small collections of lymphocytes."

The features of interest in this case are :—

1. The youth of the patient; 15 years.

2. Pregnancy, which thrived until the eighth month. In view of the fact that, according to Pfannenstiel, 90 per cent. of malignant ovarian tumours are bilateral, would it have been justifiable to remove the left ovary? and, if so, would miscarriage have occurred, or should hysterectomy have been done?

3. The long pedicle with a complete twist, with consequent rupture of the capsule and presumably flooding of the peritoneal cavity with cancer cells which caused rapidly growing metastases.

A Case of Uterus Duplex.

By H. De Sa, M.D., F.C.P.S. (Bombay),

Associate Professor of Midwifery and Gynæcology, Grant Medical College; Hon. Obstetric Physician, Sir J. J. Hospital, Bombay.

Mrs. B., aged 25, was admitted to my Hospital at 10 p.m. on the 14th of February last, bleeding rather profusely and with acute abdominal pains, pronounced on the left side—abdomen tender, tense-pulse 120, temperature 97°—looking rather pale and anxious.

Present history. She has been bleeding very slightly on and off since the 8th of February. The abdominal pains began with the bleeding, and have, after returning from a drive, increased in severity since that evening. Did not menstruate in December and January. In October last she had pains in the left pelvic quadrant and was bleeding on and off for several days. She was then admitted to a hospital and kept under observation. There was at first suspicion of an extrauterine gestation, but later on, after 21 days' stay in the hospital, she was curetted and the uterine cavity douched. She kept well until the 8th of February, but for pelvic pains and discomfort.

Previous history. Menstruation regular in frequency and duration, four to five days. General health good.

Married seven years. First full-time delivery in 1919—prolonged labour, forceps—still birth—weight 6 pounds; spontaneous abortion at six months in 1921—fœtus 3 pounds, born alive. Third, full-time delivery in 1923. Breech, normal.

On examination abdominal wall tense and tender. A distinct swelling fills the left pelvic half and rises about one and a half inches above the iliac crest, irregular in contour and nodular to the feel.

The vagina is full of blood clots, cervix slightly softened and granular to the feel. The uterus cannot be clearly defined. A cystic swelling rises from the left fornix and extends about one and a half inches above the iliac crest, pyriform and tender.

Ruptured ectopic pregnancy in the left broad ligament.

Treatment. As there was no immediate urgency, the patient was put to bed, to be carefully watched, and a small morphia injection ordered, to be repeated if required, and the operation fixed for the next morning. At 2 a.m. the pains were severe and the swelling was more central and seemed to contract with each pain. An enema

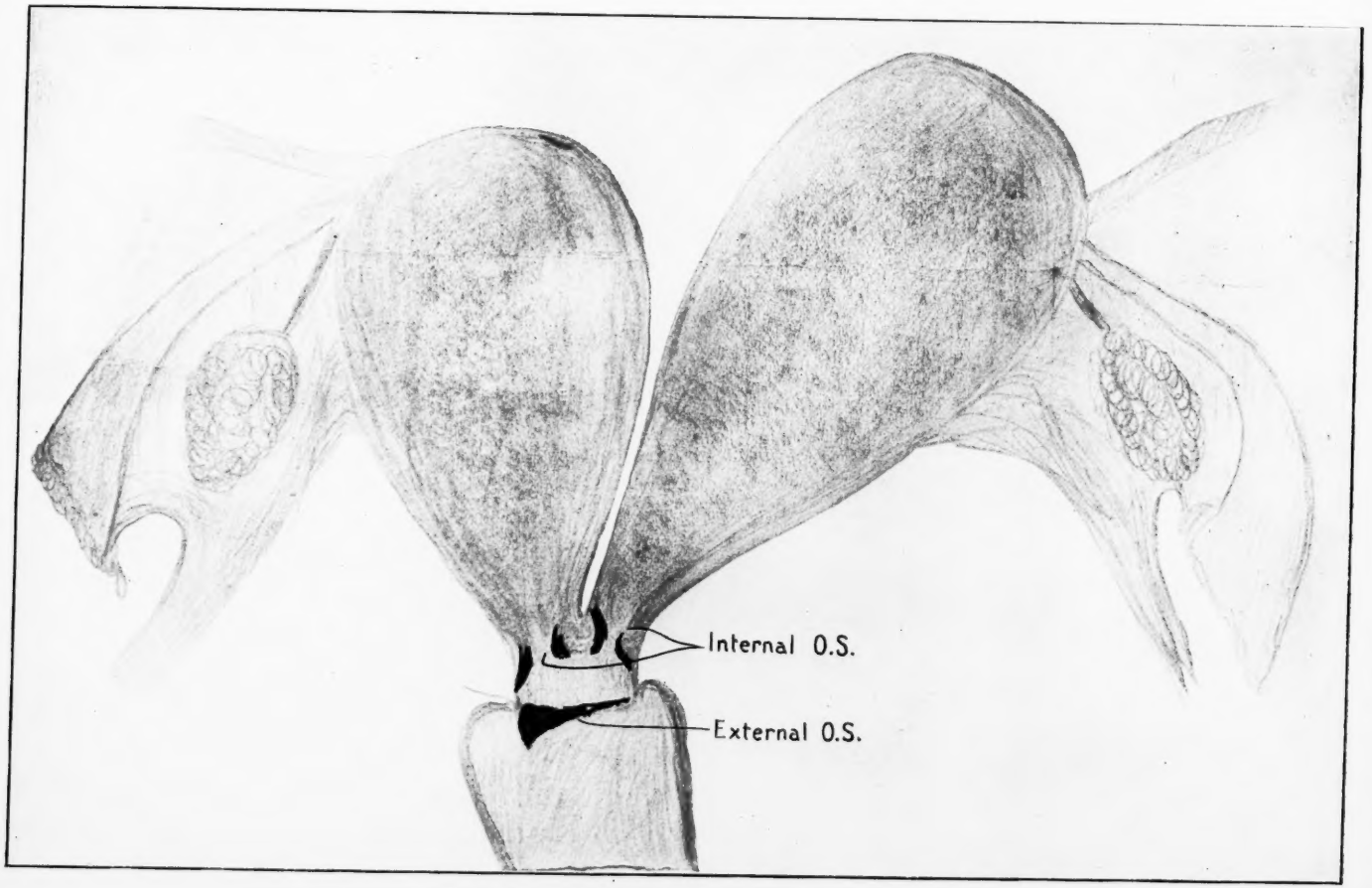
was ordered. The enema was followed by spontaneous delivery of a macerated fœtus of about 23 weeks' gestation.

I examined her on the third day, as she still complained of pain on the left side of the pelvis, and a swelling could be felt below the left iliac crest. The cervix felt wide and granular, the uterus could now be clearly defined, it was centrally situated and retroverted. The fundus uteri was slightly enlarged, a doughy mass was felt rising from the left fornix into the left broad ligament somewhat pyriform and tender to the touch. On examining the vagina with a speculum the cervix was found patent and full of proud granulations, and an old tear was apparent on the left side.

As she complained of pain on the left side, I decided to operate, and on the eleventh day after abortion I performed the operation.

On opening the abdomen, to my great surprise, I found two uteri joined together at the level of the internal os and opening into one common cervical canal. Both were fully developed, the left (puerperal) was about one-third larger than the central. As the relatives of the patient objected to hysterectomy, I removed both Fallopian tubes and closed the abdomen.

Comment. In October last she was probably threatening to abort. The central uterus was curetted while the left was threatening to abort. Pregnancy in the left uterus was not disturbed by the curettage of the central. The physical signs on admission and the true account of the previous trouble and operation led to a possible diagnosis of an ectopic gestation. The three previous pregnancies probably took place in the central uterus.



A Case of Uterus Duplex.

UNIV. OF MICH.

A Case of Intracranial Hæmorrhage in a Newly Born Child after a Normal and Easy Labour.

By Captain S. A. McSwiney, M.B., F.R.C.S.I., I.M.S., B.Ch. (N.U.I.),
Resident Surgeon, Eden Hospital for Diseases of Women and Children, Calcutta.

The following case, in which the hæmorrhage occurred for no apparent reason, is of interest in connection with Eardley Holland's valuable researches.

Mrs. A. L., an Anglo-Indian, age 25, the mother of seven children, the last being born 14 months previously, was admitted in labour to the Eden Hospital on 13th April, 1925. Her previous pregnancies and labours were normal. The presentation of the child was a vertex, and the position a left occipito anterior. The head had entered the brim of the pelvis and the membranes were unruptured. The baby was born without any interference after an easy labour, lasting altogether six hours and twenty minutes, the membranes rupturing ten minutes before the birth. The baby was well-developed and at term, and weighed 7 pounds 2 ounces, but it was blue and did not cry lustily. Vigorous methods of artificial respiration were not adopted; it was merely given a hot bath. Soon after birth it had twitchings of the left hand and occasionally a spasm of the whole body—flexor in character. Nothing abnormal in the baby could be detected on examination except the cyanosis and respirations, which were shallow and irregular. The cyanosis persisted and the baby died 14 hours after birth.

The *post-mortem* showed a very small and doubtful opening in the foramen ovale and an extensive intracranial hæmorrhage over both occipital lobes; there was a tear three-quarters of an inch long in the tentorium cerebelli.

This case seems to bear out the contention that intracranial hæmorrhage in the newly born occurs more frequently than was formerly suspected, even in those cases in which there has been no interference.

My thanks are due to Lieut.-Colonel J. C. H. Leicester, M.D., F.R.C.P., F.R.C.S., I.M.S., Surgeon to the Eden Hospital for Diseases or Women, Calcutta, for permission to publish the case.

Obituary.

JOHN BENJAMIN HELLIER, M.D. (Lond.),

Consulting Obstetric Physician, Leeds General Infirmary.

John Benjamin Hellier, who died on November 8th, 1924, has special claim to grateful remembrance by the readers of this journal, to many of whom he was personally well known. He was one of the group of provincial gynæcologists, including the late Sir William Sinclair and others, who realized the want of a periodical which would represent the work and views of obstetricians and gynæcologists throughout the British Empire. He showed his interest by becoming an original shareholder, and a communication from his pen appeared in the first part issued, this being followed by many others of great interest and value.

Hellier was a student of the old School of Medicine, Leeds, before its incorporation with the Yorkshire College. He worked with distinction. Some of his later student years were spent at University College, London, and after qualifying he held a clinical appointment at the Soho Hospital for Women, where he at once developed a special interest in gynæcology.

He became M.R.C.S, in 1875, and later graduated M.B. and then M.D., London. He took first-class honours in Medicine and the University Scholarship and Gold Medal in Obstetrics.

At the time he settled in Leeds, Obstetrics and Gynæcology were not officially recognized as a speciality, and no clinical posts existed. Hellier, therefore, worked in general practice for some years, but meanwhile became connected with the School of Medicine, first as demonstrator of Anatomy and later as Lecturer on Materia Medica. He did much excellent teaching work in both subjects.

In the middle 'Eighties, the General Infirmary established a special Department of Gynæcology and Obstetrics, to which the late Dr. James Braithwaite was attached as Obstetric Physician. Hellier, however, was appointed Surgeon to the Hospital for Women and Children, the work of which was reorganized and specialized to Gynæcology. He remained there about ten years, until the retirement of Dr. Braithwaite from the Infirmary, when Hellier took his place. Meanwhile he had been Lecturer in Gynæcology at the Yorkshire College of the Victoria University,

and later succeeded Charles J. Wright as Professor of Obstetrics in the University of Leeds.

His active term of office expired in 1918, when the University recognized his long services by conferring on him the title of Emeritus Professor. He also became Consulting Gynæcologist to the General Infirmary and held a similar position at the Hospital for Women and the Leeds Maternity Hospital.

Hellier was a Fellow of the old Obstetrical Society of London for many years, becoming in due course a Fellow of the Royal Society of Medicine, taking an active interest in the Section of Obstetrics. He entered with enthusiasm into the formation and development of the North of England Obstetrical and Gynæcological Society, and was an original member and distinguished by being elected as its President on two separate occasions. He contributed much to its proceedings. He was a Fellow of the Glasgow Obstetrical Society.

He was a concise and facile writer and among his published work was a handbook on "Infancy and Infant Rearing," which was much appreciated at the time. He wrote the article on "Fistulæ of the Female Genital Tract" in Eden and Lockyer's System of Gynæcology; a chapter on "Diseases of the Vulva" in Latham and English's System of Treatment; "Bladder Troubles in Women," in Fairbairn's Encyclopædia of Midwifery and Diseases of Women, and numerous articles and contributions to various medical journals.

As a colleague of some 35 years' standing of the late Dr. J. B. Hellier, it is fitting that I should express, however inadequately, some note of appreciation of the character of one whom we, at the University of Leeds, miss very sincerely. When Chas. J. Wright was Professor of Obstetrics, I was demonstrator of Midwifery, and Hellier shortly after, in 1889, became lecturer in gynæcology and gynæcologist to the Hospital for Women, where he and I worked together for some years until he joined the Infirmary staff. At the Medical School, the University, and hospitals we were continuously associated and did our last day's work together as recently as last October as co-examiners for the Central Midwives' Board. On that occasion it was obviously only his indomitable courage that carried him through, and we realized he could do no more. He and I on various occasions were associated in carrying out necessary changes and developments in hospital and teaching affairs, and I think no one can realize more than I the high-minded and unselfish attitude he took in all such matters. Whatever differences of opinion might have existed Hellier was always the courteous gentleman, who never allowed any personalities to arise, and whether his views and suggestions availed or otherwise he

remained the same kindly friend—a true sportsman—ready to try again. Hellier had a somewhat abrupt manner in conversation, but it was never tinged with any trace of unkindliness. He was a man of considerable culture and devoted to literature. One of his greatest and most valued assets was a very keen and deep sense of humour: we can all remember many fascinating and interesting addresses and speeches with which he entertained us at University and medical gatherings. Hellier as a hospital colleague, teacher, and friend, and even more as a man of high character, exercised a great influence for good among all who knew him.

Hellier was the son of the late Rev. B. Hellier, at one time Principal of the Wesleyan Training College in Leeds. His widow, the daughter of Mr. H. B. Harrison, of Manchester, two sons and two daughters survive him. One son and one daughter are following in their father's profession. The sympathies of his many friends and acquaintances in the profession are offered to his widow and children.

E. O. CROFT.

WALTER CARLESS SWAYNE, M.D., B.S. (Lond.), M.D., Ch.B (Bristol).

Professor of Obstetrics in the University of Bristol; Consulting Obstetrician and Gynæcologist to the Bristol Royal Infirmary.

It would be difficult to imagine anything more tragic than the sudden and unexpected death of Professor Swayne on August 13th. On the previous day he was in the best of health and spirits, taking part in an examination at the Bristol Royal Infirmary. In the evening he went to Sellick, near Ross, Herefordshire, on a visit to his son-in-law, who during the night alarmed his household by firing revolver shots at random in his room, under the impression that he was being gassed. Dr. Swayne on attempting to disarm him, received several shots in the abdomen, from which he died a few hours later. His untimely death cast a gloom over the whole of the West of England, where he was universally beloved and respected, on account of his professional ability and attractive personality.

Dr. Swayne was born on April 19th, 1862, at Malhon, in Worcestershire, being the eldest son of Mr. P. A. Swayne of Tillington Court, Hereford, and a nephew of the late Dr. Joseph Griffiths Swayne of Clifton. He was educated at King Edward's School, Birmingham, University College, Bristol, the Bristol

General Hospital and Guy's Hospital. He was a keen athlete and while at Guy's was an enthusiastic football player.

In 1888, having filled the post of Resident Obstetric Officer at Guy's, he decided to devote himself to Obstetrics and Gynæcology, and commenced practice in Clifton, where for many years his uncle, Dr. J. Griffiths Swayne, was one of the leading obstetricians and gynæcologists.

In 1891 he was appointed Obstetric Physician to the Bristol Royal Infirmary, succeeding Dr. E. Wedmore. At this time the gynæcologists were not allowed to undertake major abdominal operations, and for the first few years after his appointment he encountered great opposition from the general surgeons, but in spite of this he eventually won through, and succeeded in establishing a modest clinic in obstetrics and gynæcology. Dr. Swayne was one of the first in Bristol to adopt the "aseptic technique" in obstetrics and gynæcology, and strictly carried out every detail of this method.

He was a most capable and painstaking operator, and his results were excellent. His wide knowledge of his speciality, and his great practical experience, made him a most expert diagnostician, and his sound judgment and advice were greatly valued by his colleagues and a large circle of general practitioners.

He was an excellent teacher, and his lectures and clinical demonstrations were greatly appreciated by successive generations of students. Dr. Swayne at the time of his death was Professor of Obstetrics and Gynæcology in the University of Bristol. He was keenly interested in University politics, and was always to the fore in any movement which sought to improve the clinical teaching of students. His sound advice and enthusiasm will be sorely missed by the University.

Dr. Swayne contributed numerous articles on obstetrics and gynæcology to the medical journals, and a few years ago carried out some important research work in connexion with eclampsia. In 1913 he edited the eleventh edition of his uncle's well-known book, "Swayne's Obstetric Aphorisms." He belonged to numerous Medical Societies, being a Fellow of the Royal Society of Medicine, Member of the Visiting Gynæcological Society, Member of the Bristol Medico-Chirurgical Society, Member of the Midland and West of England Gynæcological Society, having held the presidential chair of the two latter. He had also been an Examiner in the Universities of London, Birmingham, Bristol and Leeds.

In 1894 Dr. Swayne married the daughter of the late Rev. R. F. Heath, and his widow with three daughters and a son survive him.

Dr. Swayne was an ardent supporter of the Volunteer Movement, and having joined the Gloucestershire Artillery Volunteers as a trumpeter, eventually rose to the rank of Major. At the outbreak of the European War he was in command of the Bristol University Officers Training Corps. Subsequently he raised the third line of the South Midland Royal Field Artillery, and finally commanded a battalion of the New Zealand Artillery on Salisbury Plain. As might be expected, his enthusiasm, devotion to work, and concern for the welfare of his men, made him an ideal officer. In private life Swayne was a most lovable personality, absolutely unselfish, and never happier than when he was helping some junior colleague. The great esteem in which he was held was shown by the crowded attendance at the Memorial Service held at All Saints, Clifton, on the day of his funeral.

His untimely death leaves a gap which it will be very difficult to fill. We can ill afford to lose such men.

D. C. Rayner.

HAROLD CLIFFORD, M.B., F.R.C.S. (Edin.),

Surgeon to St. Mary's Hospitals, Manchester, and Surgeon for Women, Royal Salford Hospital.

The news of the death of Dr. Harold Clifford, of Manchester, must have come as a sad surprise to many readers of this Journal, as it did to many of his near neighbours. It is true he had not been in very good health for three or four years, but the symptoms were not such as to arouse any alarm. He had suffered from digestive troubles at times, and had a very painful neuritis in one arm, which to some extent interfered with his work. Latterly he had some attacks of epistaxis—one very severe—and he seemed to have small patches of subcutaneous hæmorrhage. In April last, while he was operating, his sight suddenly failed. He was able to finish the operation, but his vision rapidly grew worse, and in the evening he was almost quite blind. His condition was diagnosed as due to an intracranial hæmorrhage. He was kept in bed in a subdued light for four or five weeks. During this time he showed great courage: he realised that it was quite possible that his professional life was at an end, but he discussed the situation quite calmly. At the end of June he was able to move about, and even to read letters with some difficulty. His general health was better and he was in good spirits. He decided to go on a sea voyage, and had booked his passage on a steamer bound

for South America on July 9th. On July 5th he had some gastric disturbance, and the following evening he became restless, and he died early on Tuesday morning, July 7th, from a severe cerebral hæmorrhage.

Dr. Clifford was born in 1873, and was the son of the late Rev. Dr. Clifford, who was famous as a preacher and as a politician. His mother was a sister of Dr. Carter, of Liverpool, at one time Professor of Medicine in that city. He studied medicine at University College, London, and graduated M.B. (Lond.) in 1899. Soon after he was appointed house physician to University College Hospital, and later medical officer to the cancer wing of Middlesex Hospital. In 1901 he applied for the post of resident obstetric surgeon to St. Mary's Hospital, Manchester, and, as he was supported by strong testimonials from his London teachers, he was elected. His progress in Manchester was steady; in 1912 he became assistant surgeon, and in 1919 surgeon to St. Mary's Hospitals. He was at one time surgeon to the Northern Hospital for women and children, Manchester, and latterly surgeon for women to the Salford Royal Hospital. He was also a lecturer on clinical obstetrics in the University of Manchester. He was a member of the North of England Obstetrical and Gynæcological Society for many years, and held the office of President in 1922.

Dr. Clifford was handicapped for the struggle of life by ill-health. A delicate infancy left him with rather a poor physique, but he had an alert and active brain, clear judgment, and a cheerful and genial disposition. He gave an example of what could be accomplished by a courageous and resolute spirit in a frail body. He was never fitted for any form of severe physical exercise, and the recreation of outdoor games or any kind of sport was barred to him. It was his lack of stamina which determined his mode of life, and it is to be regretted that he did not live in healthier surroundings. As it was, he was content with the life of a town-dweller. He was a bachelor and lived in the centre of the city. He found his pleasure in his work during the day, and in reading and the society of his friends in the evening. The City of Manchester is more or less deserted after business hours, and for this reason many of his afternoons and evenings were spent at one or other of his clubs in town: in this way he formed a large acquaintance and many staunch friends. He had an indefinable charm of personality which attracted many, and few men have been more popular in their own circle. He was an excellent host, and seemed to be happiest when he was entertaining his friends. There is no doubt that at times he suffered from depression and often had a wistful air.

Dr. Clifford was well equipped by his extensive hospital prac-

tice for consulting work. He was good in diagnosis and sound in judgment, and always gentle and considerate in his dealings with patients. As an operator he followed as far as possible the line of safety : he had none of the qualities of the surgical pioneer; but he had a reputation for safety and was held in high esteem by both medical men and by his patients. As a colleague he was very acceptable, and his opinion was always worth having. He avoided extremes and had a large store of sound common sense. For one of his experience he contributed singularly little to medical journals. This, I believe, was largely due to his health. After a day's work in hospital and private practice he had little energy left.

Although he held so many important appointments and had attained to a position of distinction in his special department, he never sought publicity—on the contrary, he did all in his power to avoid it, and preferred to remain in the background. This shrinking from publicity was largely temperamental, but it might have been partly the result of early association. Among his friends, although he was quiet and reserved in manner and never asserted himself strongly, he nevertheless had an air of complete composure which inspired confidence.

His death has been keenly felt by all who knew him well, and he will be much missed by a large circle of friends and by his colleagues.

A. D.

BOOK REVIEWS.

" Midwifery." By TEN TEACHERS. Under the direction of COMYNS BERKELEY, M.A., M.D., M.C. (Cantab.), F.R.C.P. (Lond.), Obstetrical and Gynæcological Surgeon to the Middlesex Hospital, etc., etc. Edited by H. RUSSELL ANDREWS, COMYNS BERKELEY and J. S. FAIRBAIRN. Third edition, 1925. pp. 778 (including index), xxi. Edward Arnold. Price 24/- net.

THE official description of this work given above, is likely to take the wind out of the sails of any reviewer, not pacifically inclined, for he would be a brave man indeed who single-penned attempted to criticize adversely a production with so distinguished a cast. We make no claim to such bravery; besides we remember that aggregations of men have neither bodies to kick nor souls to damn.

This is the third edition, and the world of students will clamour for more; and naturally, for they wish to satisfy the examiners and to qualify.

There are several " novel features " in the new edition which will encourage the scrapping of the second and the purchase of the third. Radiographs are used for the first time. A very beautiful one occupies the place of honour as frontispiece, but it is not well reproduced : as represented it is indeed a skiagram.

We have not read the book *verbatim*, or even paginally, but would advise every student to do so. He will find the descriptions extremely lucid and practical. The various writers have given of their best : they have occasionally gone to the trouble of delving into the innermost recesses of their imaginations, not always with great success. It would be an interesting sight to see Mr. 1/10 attempting to perforate with the central limb of the three-bladed cephalotribe (p. 708). Munro Kerr anticipated such misdirected enterprise when he wrote " This middle blade is not employed as a perforator."

The chapters on the toxæmias of pregnancy are excellent. We know of no account that explains more clearly our present knowledge of this subject, which is always an extremely difficult one for the average student to understand.

Likewise, for the most part, the management of normal and abnormal labour is adequately and well discussed. We may, nevertheless, be allowed to suggest that all obstetricians, not excluding the Ten Teachers, should study Potter's book on Version, for, however reprehensible his views may be thought, his methods are excellent, and deserve wide recognition and imitation.

We are glad to find that rupture of the membranes and the intramuscular injection of infundibulin are advised for certain cases of concealed accidental hæmorrhage, a method condemned, wrongly in our opinion, in some text-books.

By way of helping the editors, if they are willing to accept suggestions concerning a work which has attained so high a degree of success, we would submit the following points, some perpetuated from the previous editions, on which they may sit in judgment.

(1) May not X-rays be utilized in the diagnosis of pregnancy? We have even found a radiograph of early pregnancy a useful means of convincing a recalcitrant female of a virgin conception. Moreover, there is no mention of the great value of a radiograph in the recognition of a full-time pregnancy and of post-maturity.

(2) Has not a negative slipped out of line 9, page 234?

(3) Is the usual teaching concerning uterine inertia, here adopted in a mutilated form, worth bolstering? Surely all forms of inertia are due either to muscle defects or to deficient stimulation. The "exhausted muscle" idea has never been proved scientifically, and there is much to be said against it. Until inertia and tonic contraction are considered (mentally) side by side, and contrasted, the whole subject will continue to be unintelligible, even to the teacher.

(4) Not unrelated to this subject is the question of the use of infundibulin in obstetrics. A short chapter of one page and a half is devoted to "The use of pituitary extract in *labour*" (italics ours). Considering the tremendous importance of this subject to-day, should not the student have been taught a great deal more about the obstetrical uses of this extract, and the dangers of improper use during labour? Incidentally, we may mention that injection into the gluteal muscles is often difficult, whereas injection into the triceps is easy. Why was the gluteal route ever chosen? Proximity to the field of operation was, we suppose, the deciding factor.

(5) What a dreadful time the man who posed his arm as a model for the artist to illustrate intravenous infusion must have had with the improvized tourniquet. Why teach cruelty?

No doubt there are many other points which are worthy of reconsideration before the next edition is issued; but we have refrained from seeking them, for we realize that even the remarks already made may be held to be due to the captiousness of an unappeased mind—a mind looking for perfection in his friends.

Nothing that has been said can seriously detract from the value of this book, which has passed the scrutiny of 10×2 eyes belonging to men who are all versed in the wiles of filling the hiatuses and air-pockets that exist in the student's brain, and one also skilled in the humorous exploitation of the failings of others.

The stout volume is well turned-out. It is just the right colour, and it has a reassuring array of names on the back, but we think that those of the authors should be in larger type than that of the publisher, if he has no objection, and there is room.

B. B.

"Operative Gynæcology." By HARRY STURGEON CROSSEN, M.D., F.A.C.S., Professor of Clinical Gynæcology, Washington University Medical School, and Gynæcologist-in-Chief to the Barnes Hospital, and the Washington University Dispensary; Gynæcologist to the St. Luke's Hospital; Consulting Gynæcologist to the Jewish Hospital, St. John's Hospital and the St. Louis Maternity Hospital. Third Edition. Large Octavo, 662 pages, with 887 original illustrations. Price 52/6. Henry Kimpton, Ltd., 263, High Holborn, W.C.

THIS is the third edition of this book published within the last ten years. The work is commendable in that it encompasses the whole domain of

operative gynæcology within a volume of reasonable size. To attain this end operations upon organs adjacent to those of the organs of generation have been purposely omitted, which we think is a sound principle, as nowadays the majority of surgeons embarking upon the practice of this speciality have already had a sound and thorough training in general surgery and can refer to books on these subjects for all extraneous matter. The multiplicity of operations which have been devised and performed for the cure of certain conditions, such as prolapse and retrodisplacements of the uterus, make it evident, as is the case with most diseases having many supposed remedies, that the after-results are often far from satisfactory. In this connexion the author has rendered valuable service by making the keynote of his work the *selective* operative treatment of the various conditions described. The first two chapters of this edition, comprising some 180 pages, are concerned entirely with the various operations, nearly 100 in number, which have been performed for the relief of prolapse and backward displacements; this in itself shows the complexity of the subject, and to the average individual is somewhat confusing, but the indications for the selection of any particular operation are clearly enumerated, and furthermore, in this edition the author has, at the suggestion of previous reviewers, stated his own personal views and practice in more detail, which, coming from one of the author's experience, has greatly added to the value of this edition. A notable feature of the book is the dearth of proper names attached to the various operations described; we think on the whole this is an advantage, as although there is no objection to the use of a personal name or short designation for a clearly understood operative procedure, it undoubtedly tends to lead to confusion, and militates against a clear understanding of the operative situation as a whole. This edition is somewhat larger than the last as the advance in operative technique has necessitated the inclusion of over ninety additional illustrations. We note the author is very averse to the performance of ventral suspension of the uterus during the child-bearing period of a woman's life, giving as his reason the uncertainty of the amount of fixation that will result. Although we are in general agreement with the inadvizability of the operation, is it not more a question of the part of the uterus selected for fixation? So far as we are aware no ill effects with regard to future pregnancy have been published when the fixation has been made low down on the anterior uterine surface. We are more than disappointed with the scanty information given with regard to the operation of myomectomy. In a comprehensive and up-to-date volume such as this, fifty lines is all that is devoted to this subject. When one remembers that the myoma is the commonest uterine tumour found during the fertile period of a woman's life and the operation of myomectomy is the ideal curative operative treatment, we consider this subject is worthy of considerably more space. No mention is made of the single incision in the anterior wall of the uterus through which all interstitial, and the large majority of other fibroids can be enucleated, while the usefulness and advantages of the "hood operation" are entirely ignored. We hope in future editions, which we are confident will appear, this subject will be given the space it certainly deserves. The operative treatment of cancer of the uterus is well described. We note the author advises against the routine removal of the lymph glands when operating for carcinoma of the cervix. Sound advice, the outcome of the author's mature experience, is given on the still controversial subject, "radium *versus* operation in the

treatment of carcinoma cervicis." When describing the radical operation the author advises the extensive separation of the bladder from the vagina prior to the separation of the rectum behind. Is this advisable? We consider that the greatest advancement made in the technique of this operation recently has been the postponement of this step until the later stages of the operation, and that after determining the operability of the growth, dividing the broad ligaments and defining the ureters posteriorly, the separation of the rectum should be at once carried out, leaving the extensive bladder separation until the last; in this way the bleeding, which, as the author rightly points out, is most likely to occur during the bladder separation, is left to the last, and can be more readily controlled.

An interesting and ingenious operation is described for the relief of proximal tubal obstruction as performed by the author, whilst a most useful chapter is included on the medico-legal points that arise in connexion with gynæcological work as carried out in America. The book is exceedingly well written, abundantly illustrated, and the text free from printer's errors, the only one we could find was the mis-spelling of gonorrhœa on page 436. We can recommend the book with confidence to all gynæcologists and others interested in this special branch of surgery.

A. O. G.

"Biologie und Pathologie des Weibes." By HALBAN and LEITZ. Part 15, vol. v, pp. 333—556. Price 10 Marks.

This part contains articles on the relation of affections of various organs to gynæcology.

The relation of diseases of the eyes to the genitalia is treated of by Prof. J. Novak; that of the circulatory apparatus by Prof. v. Jagié; that of the blood and blood-forming organs by Prof. v. Jagié and Dr. Hickl; that of the liver and kidneys by Dr. Eckelt, and that of the sedimentation-rate of the blood cells by Prof. Linzenmeier. Gynæcologists will be most interested in the last-named of these articles.

Illustrations are given of the apparatus for determining the sedimentation-rate, which is given by Prof. Linzenmeier at over 1,500 minutes for blood from the umbilical cord; 10 to 60 minutes for the blood in congenital syphilis, 600 minutes for man's blood and 200—350 minutes for woman's blood, 55 minutes for the blood in pregnancy, under 100 minutes for chronic inflammatory processes, and under 35 minutes for acute inflammations.

The value of the leucocyte-count and the sedimentation-rate in cases of fever and tubal abortion are discussed, and the whole of this article is full of interest.

H. S.

"Biologie und Pathologie des Weibes." By HALBAN and LEITZ. Part 17, vol. v, pp. 513—798. Price 17 Marks.

The present part contains articles by Prof. R. Matzenauer on Syphilis, soft chancre and parasitic diseases of the external genitals; by Prof. E. Martin on Diseases of the pelvic cellular tissues; by Prof. Freund on Diseases of the abdominal wall, ligaments, blood-vessels and nerves of the female genital apparatus, and by Prof. Sternberg on Tumours of the ovary.

The article on venereal diseases is an excellent one and is illustrated by fine coloured plates.

In the article on Diseases of the pelvic cellular tissue some new drawings are given; one of these, fig. 91, appears to be somewhat diagrammatic judging from the position of the right ovary and tube. There is a very brief description of tumours of the cellular tissue; no adequate account is given of paravaginal tumours, which are of much interest to gynæcologists.

Diseases of the navel occupy less than a page and no mention is made of adenomyoma.

The articles on Ovarian tumours are good, but lack something in completeness. We think an explanation may be found on reading the literature on ovarian tumours at the end of the part; for out of more than 120 references there is only one to other than German sources. H. S.

Review of Current Literature.

DIRECTOR: FRANK E. TAYLOR,
M.D., B.S. (Lond.), F.R.C.S. (Eng.), M.R.C.P. (Lond.), D.P.H. (Cantab.)

THIS Review will contain the lists of contents, and abstracts of the more important articles, from the following journals, with which the "Journal of Obstetrics and Gynæcology of the British Empire" exchanges:—

British.—The Lancet; British Medical Journal; The Hospital and Health Review: Medical Science: Abstracts and Reviews.

Canadian.—The Canadian Medical Association Journal; Bulletin Medical de Quebec.

Australian.—Medical Journal of Australia.

South African.—Medical Journal of South Africa.

American.—American Journal of Obstetrics and Gynæcology; The Journal of the American Medical Association; Surgery, Gynæcology and Obstetrics.

French.—La Gynécologie; Gynécologie et Obstétrique; Bulletin de la Société d'Obstétrique et Gynécologie de Paris; Revue de Gynécologie et de Chirurgie Abdominale.

Belgian.—Bruxelles-Médical.

Italian.—Annali di Ostetricia e Ginecologia; Archivio di Ostetricia e Ginecologia

German.—Zeitschrift für Geburtshülfe und Gynäkologie; Archiv für Gynäkologie; Zentralblatt für Gynäkologie; Monatsschrift für Geburtshülfe und Gynäkologie; Münchener Medizinische Wochenschrift.

Scandinavian.—Acta Gynecologica Scandinavica.

South American.—Boletin de la Sociedad de Obstetricia y Ginecologia de Buenos Aires.

It is hoped that the Review of Current Literature will keep the readers of this Journal in touch with current work throughout the world. At the end of each year it is proposed to print an Index of all the subjects contained in the articles of the above journals. Arrangements will also be made to include abstracts of important articles on border-line subjects, such as Physiology, Biology and Biochemistry.

LIST OF ABSTRACTORS.

London: J. R. FORREST, DOROTHY N. L. LEVERKUS, M.B., A. SPONG, F.R.C.S., F. E. TAYLOR, F.R.C.S.
Leeds: A. GOUGH, F.R.C.S.
Liverpool: ROBERT A. HENDRY, F.R.C.S.
Sheffield: W. W. KING, F.R.C.S.
Glasgow: JANE H. FILSHILL, JAMES HENDRY, M.D.
Sydney: T. FARRANRIDGE, M.B.

Lancet.

April 4, 1925.

Carbohydrate metabolism during pregnancy.
*Treatment of acute peritonitis. F. Jeans.

April 11 1925

*Fatty contents of the ovum.

May 2, 1925.

*Light in the prevention of rickets. F. H. Humphries.

May 9, 1925.

The problem of the phlyctenular child. (Illustrated.) L. Gavin and T. W. Preston.

May 16, 1925.

Carbohydrate tolerance in pregnancy. (Illustrated.) H. F. Höst.

Rickets and cholesterol. O. Rosenheim and T. A. Webster.

June 6, 1925.

*Cancer of the breast. An attempt to estimate the duration of life at the operation. S. Wyard.

June 20, 1925.

*The problem of malignancy from a purely radiological standpoint. A. E. Barclay.

Treatment of acute peritonitis. This is a special paper, contributed by invitation, on the treatment of medical and surgical conditions. Jeans gives the signs of peritonitis; he, apparently, still believes in drainage tubes.

In conclusion he states that: "Early and quick operation, suprapubic drainage, Fowler's position, and administration of salines have altered during the last 20 years the morbidity of general peritonitis from over 80 per cent. to less than 20 per cent."

Fatty contents of the ovum. An account of the non-saturated fats present in certain mammalian ova given by Prof. Arthur Robinson at a recent meeting of the Anatomical Society at King's College, London. Professor Robinson drew attention to the fact that there seems to be no evidence at all of the path or means by which the non-saturated fat finds its way into the ovum, for there is absolutely no sign of its existence at any time in the cells or fluid surrounding the germ cell in the follicle.

Light in prevention of rickets. This is a paper read at the Fourth International Congress of Thalasso-Therapy held at Breachon. Humphries thinks that the time will come when it will be generally acknowledged that light can prevent rickets as surely as vaccination can prevent small-pox. He draws attention that Mellanby has suggested that the anti-rachitic vitamines in food are increased, or made more active by exposure to ultra-violet radiations, and that these tend to conserve injested calcium and phosphorus for the use of the growing organism.

He states that the raying of every child for a month or six weeks during the first year of life would do much to eradicate this widespread disease; two or three hours a week would, he says, be all that is necessary.

Carbohydrate tolerance in pregnancy. This is an account of an investigation carried out in the University Obstetric and Gynæcological Clinic, Oslo, Norway. The object was to discover how often glycosuria can be produced in pregnancy, whether the glycosuria is a result of a low renal threshold or is due to a big blood-sugar rise, and lastly whether any cause for the low threshold or the marked hyperglycæmia which provokes the sugar excretion can be found.

The investigation showed that "there is a curious and characteristic difference in the blood-sugar rise and position of the renal threshold in the

first and second periods of pregnancy. Early in pregnancy the position of the threshold is normal and the blood-sugar rise is often remarkably high, so that glycosuria is due to the marked hyperglycæmia, and is not, as is generally believed, of renal origin. In the latter part of pregnancy, on the other hand the blood-sugar rise is usually small, but the renal threshold nevertheless is often so low that glycosuria frequently occurs, which therefore, in this stage of pregnancy, can rightly be termed renal."

It is suggested that the corpus luteum causes the large and prolonged blood-sugar rise so characteristic of early pregnancy, while the low renal threshold in the later months appear to be dependent on the fœtus or placenta.

Cancer of the breast. This is an endeavour to trace all the patients operated on in the Cancer Hospital during the years 1905—1915 inclusive. In practically every case an attempt at radical excision had been made.

The author is able to reach the following conclusions amongst the cases traced :—

(1) The actual average duration of life after operation is about five years.

(2) The average duration of life after operation is greater by two years than that of unoperated cases from onset to death.

(3) The age of the patient does not influence the prognosis.

(4) The very earliest glandular infection enormously reduces the chances of cure.

The problem of malignancy. This is a paper read by Barclay before the American Medical Association at Atlantic City last May. He summarized his paper by stating that the only cases in which we can hope for cure are those in which we have a radio-sensitive tumour, an absence of the underlying cause, and complete extirpation either by operation or by radiation, or by a combination of the two. Should the growth be radio-insensitive, there is no chance of cure unless a surgeon is fortunate in removing the whole growth.

A. Spong.

British Medical Journal.

April 4, 1925.

*The separation of the placenta. K. Vaughan.

Torsion of the Fallopian tube. D. J. Davies.

April 11, 1925.

*A method of determining the patency of the Fallopian tubes by X-rays. With diagrams. E. Williams and R. Reynolds.

April 18, 1925.

An anoxæmic type of infantile atrophy. Botwood, Raper and Willcock.

April 25, 1925.

Puerperal sepsis in Wales. E. Maclean.

May 2, 1925.

Carcinoma of the rectum complicated by pregnancy. R. Maunsell.

*A fatal injury to the vagina. R. Blair.

*Post-mortem Cæsarean section—a living child. H. Roberts.

May 9, 1925.

Treatment of inoperable carcinoma of the cervix uteri with radium. M. Donaldson.

Radium treatment of inoperable carcinoma of the cervix. G. Strachan.

May 23, 1925.

Melæna neonatorum treated by injection of paternal blood.

*Mitral stenosis in pregnancy. Cæsarean section. J. H. Tonking.

June 6 1925.

Anencephalic fœtus. D. S. Richmond.

An address on infundibulin. The indications for its use in surgical and obstetrical practice. W. Blair Bell.

June 20, 1925.

Painless pelvic surgery. F. J. McCann.

A study of the efficiency of sterilization of dressings. Hall and Chapman.

A clinical and bacteriological investigation of puerperal fever. G. Fitz-Gibbon and J. Bigger.

An investigation into the etiology of puerperal fever. J. Bigger and G. FitzGibbon.

Separation of the placenta. Vaughan advocates leaving untied the maternal end of the umbilical cord. It is not a new suggestion but formed her conclusions after observing the placenta during the performance of Cæsarean section. She states that tying the maternal end of the cord (1) delays delivery of the placenta; (2) prevents full contraction of the uterus; (3) increases liability to retention; (4) involves risk of septic infection through maternal sinuses which are still kept open by the engorged villi.

A method of determining the patency of the Fallopian tubes by X-rays. The method was suggested to them by Bond's experiment of the recovery at a laparotomy of coloured particles from the peritoneal cavity of rabbits after their previous introduction into the vagina. They suggest the injection of barium sulphate into the uterine cavity—the barium sulphate is dropped in, no pressure being used. They got the best results under general anæsthesia. The shadow of the body of the uterus gave a much more accurate estimation of the size of the uterine cavity in cases of infantile uterus or other maldevelopment, than does bimanual examination, the latter only revealing the gross size. They used the method to determine patency of a tube after salpingostomy for tubal mole, and also in a case of double uterus. In no instances were after-effects noticed or complained of by the patients. They suggest the obvious inference, that this ascent of particles throws light on the origin of ascending infections of the genital tract.

A fatal injury to the vagina. Blair describes a case of rupture of the vagina produced by coitus in a woman of 55, with a description of the post-mortem findings. He mentions that Neugebauer reported on over 150 cases of the same nature.

Post-mortem Cæsarean section—a living child. Roberts gives an account of a woman being admitted into a hospital moribund, and dying immediately in an eclamptic fit. Seven minutes after death an apparently lifeless full-time child was extracted by Cæsarean section and eventually revived.

Mitral stenosis in pregnancy. Tonkin describes a case of severe auricular fibrillation in which he successfully performed Cæsarean section rather than run the risk of a prolonged labour. A. SPONG.

Journal of Physiology.

Vol. lx, No. 3, *July* 14, 1925.

*The relation of ovarian function to menstruation. W. Shaw.

The relation of ovarian function to menstruation. The aim of this research was to test the work of R. Meyer and of Schröder so that, if confirmed, the principles they deduced might be applied to the investigation of pathological conditions of the ovaries when diseases of the uterus are present. The method employed was histological and its object was to examine the endometrium at various phases of the menstrual cycle, particularly during menstruation; to examine the ovaries for corpora lutea; to compare these histological results with the menstrual history, and in this way to obtain any relation which may exist between the ovaries and the endometrium.

The conclusions arrived at are :—

(1) The pre-menstrual changes are first observed about the 14th day of the cycle, the cycle being regarded as commencing on the first day of the menstrual discharge. At the end of the menstrual cycle the pre-menstrual endometrium resembles the decidua of early pregnancy.

(2) During menstruation a degeneration of the hyperplastic endometrium occurs which results in the shedding of the superficial portions of the latter.

(3) Ovulation in the human female takes place between the 13th and 17th days of the cycle.

(4) The corpus luteum attains its state of maturity on the 19th day and persists in its mature form until about the 27th day.

(5) On the 28th day and during menstruation the corpus luteum is degenerate.

(6) If pregnancy occurs the corpus luteum persists in its state of maturity until about the 12th week, and the pre-menstrual changes of the endometrium become better developed to form the decidua.

(7) Evidence has been brought forward to suggest that the corpus luteum is responsible for the production of the pre-menstrual changes and of the decidua if pregnancy occurs. F. E. T

The Canadian Medical Association Journal.

March, 1925.

*On maternal mortality in Canada. H. MacMurchy.

April, 1925.

*Radiation in the treatment of benign diseases of the female pelvis. G. E. Richards.

The treatment of the pernicious vomiting of pregnancy. H. B. Atlee.

May, 1925.

*Newer methods for the determination of pregnancy. R. Mitchell.

*Pyelitis of pregnancy. J. C. McClelland.

*Extreme sensitization in infants to cow's milk protein. F. F. Tisdall and J. R. Erb.

The artificial feeding of normal infants with sweet cow's milk. R. R. Struthers. (Retrospect.)

June, 1925.

Twilight sleep in obstetrical practice with reports of cases. W. E. Bateson.

On maternal mortality in Canada. Comparing the maternal mortality in Canada with that in other countries MacMurchy gives the following table :

Year.	Country.	Number of Maternal Deaths.	Rate per 1,000 Births.
1922	Denmark	146	2.0
1922	Netherlands	454	2.5
1918	Sweden	304	2.5
1916	Italy	2,351	2.6
1920	Switzerland	235	2.9
1923	England and Wales	2,892	3.8
1922	Australia	621	4.5
1923	Spain	3,010	4.6
1923	Irish Free State	297	4.8
1923	North Ireland	148	4.9
1920	Germany	7,865	4.9
1922	New Zealand	149	5.1
1922	Belgium	827	5.4
1922	Canada (Registration Area)	907	5.5
1916	France	1,895	6.0
1923	Newfoundland	46	6.2
1923	Scotland	718	6.4
1922	United States (Registration Area) ...	14,657	6.6

Radiation in the treatment of benign disease of the female pelvis. Richards reports the successful treatment by radiation of the following groups of cases : (1) Bleeding in young women ; (2) Menorrhagia from fibrosis uteris, and (3) Fibroids. In the case of large multiple fibroids he has had less success, having seldom seen complete disappearance of these tumours. He considers that such cases should only be treated by radiation when operative interference is definitely contraindicated.

Newer methods for the determination of pregnancy. From a review of these methods Mitchell draws these conclusions :—

(1) The Abderhalden test is of great scientific interest, but at present of no practical value in the determination of pregnancy.

(2) It has been definitely established that there is a lowered assimilation threshold for sugar in pregnancy leading to a spontaneous or readily induced glycosuria.

(3) The methods of Frank and Nothmann, Roubitschek, and Kamnitzer and Joseph give presumptive evidence for or against pregnancy.

(4) The pneumo-peritoneal Röentgenogram may be of great value in the diagnosis of early pregnancy.

(5) There is no doubt that great and important discoveries will be made in bio-chemical studies of the pregnant woman.

(6) While the diagnosis of pregnancy in the vast majority of cases will continue to be made by the usual methods of history taking and physical examination which are usually sufficient, the newer methods described will be of considerable value in confirming, or, in some instances, of establishing a diagnosis which has not been arrived at by the older methods.

Pyelitis of pregnancy. Recording 13 cases McClelland found pyelitis of pregnancy to be more common in patients 25 years and under, during the

middle three months of pregnancy, and in the first pregnancy. *B. coli* is the common infecting organism and residual urine in the ureter and kidney is relieved by an inlying ureteral catheter.

Extreme sensitization in infant to cow's milk protein. Tisdall and Erb record two cases of this condition. They consider that the diagnosis usually presents little difficulty on account of the striking and unusual symptoms which appear directly after the first administration of cow's milk. These symptoms usually are : refusal of the infant to take cow's milk after a few drops have been swallowed, followed by pain as evidenced by crying, swelling of the skin and mucous membranes wherever touched by the milk, and symptoms of shock as evidenced by rapid shallow breathing and cyanosis. Sometimes a general urticaria of the skin appears.

The treatment consists in desensitizing the infant by giving minute doses of cow's milk which are gradually increased until the necessary amount for the nutrition of the child is administered. To accomplish this usually requires three or four months' time. F. E. T.

The Medical Journal of South Africa.

Vol. xix, No. 6, *January*, 1924.

Observations in obstetrics. J. Bruce-Bays.

*Pyelography as an aid to diagnosis in chronic abdominal pain. E. B. Fuller.

Vol. xx, No. 2, *September*, 1924.

*The avoidable wastage of child life in South Africa. J. A. Mitchell.

Vol. xx, No. 3, *October*, 1924.

Modern conceptions in regard to the diet of healthy infancy in childhood. E. P. Baumann.

Pyelography as an aid to diagnosis in chronic abdominal pain. Fuller believes that with the improvement of pyelographic technique a new era in the understanding of kidney and uretal diseases and irregularities has arisen. He exhibits the pyelograms of a series of cases which had, as a main feature, chronic recurring abdominal crises of a painful nature, usually one-sided, but sometimes of a more general distribution and affecting the general health. The results of these pyelograms have been so startling and important that Fuller asserts that no case of doubtful abdominal pain can be considered to have been satisfactorily investigated until the condition of the kidney and ureter has been disclosed by means of a pyelogram.

The avoidable wastage of child life in South Africa. Discussing wastage before and at birth Mitchell says that there is a considerable pre-natal wastage which could be prevented by more knowledge and care of expectant mothers, and, especially in the larger urban centres, better facilities for the recognition and treatment of venereal diseases. There is also much avoidable loss of infant life during labour, and at birth, due mainly to the inadequate facilities for midwifery attendance, especially in rural districts. The supply of trained midwives is quite inadequate. In the majority of births in the Union the nursing attendance is provided by women of little or no training. F. E. T.

Surgery, Gynæcology and Obstetrics.

April, 1925.

Actinomycosis of the ovary and tube. F. C. Helwicz.

*Diverticulum of the bladder causing dystocia at labour. Report of a case. W. L. Wolfson.

The cytological examination of the urine as an aid to the diagnosis of tumours of the genito-urinary tract. F. J. Parmenter.

Diphtheritic vaginitis. Report of two cases. B. F. Lash.

*Chronic endocervicitis; its clinical importance and results from treatment with the electric cautery. C. H. Davis.

*The treatment of chronic gonorrhœa in women with the electric cautery. H. W. Shuthe.

May, 1925.

Gynæcological conditions treated with radium alone and combined with surgery. Report of 156 cases. W. S. Smith.

Superfœtation—a probable case. J. M. Maury.

Prolapse of the female urethra. T. J. Watkins.

Residual urine in women. A. H. Curtis.

The sedimentation test in obstetrics and gynæcology. J. L. Barr and R. A. Reis.

*Management of occipito-posterior position with special reference to the application of the Kjelland forceps. S. J. Scadim.

*Pneumo-peritoneum as an aid in the diagnosis of obscure pelvic lesions and early pregnancy. L. E. Burch.

Closing endometrium in Cæsarean section. O. C. Cox.

June, 1925.

*The treatment of general peritonitis. G. E. Armstrong.

Amelioration of labour pains by morphine-magnesium-sulphate injections and colonic ether instillations. Directions for administration by method evolved at the Lying-in Hospital of the City of New York. A. B. Davis.

Diverticulum of the bladder causing dystocia at labour. This is a report of an operation for a large diverticulum of the bladder. The operation was performed nine months after the labour. The actual labour had been very prolonged—17 hours—and had been terminated by the *accoucheur* by the application of forceps, who declared at the time that he experienced some obstruction which was suddenly overcome with a jerk. The actual condition was diagnosed by cystoscopy.

Chronic endocervicitis; its clinical importance and results from treatment with the electric cautery. Davis treats this troublesome condition by cauterizing the cervical canal, using a suitable nasal cautery tip longer than usually supplied. He finds that it is only necessary to cauterize the glands near the external os in many cases. With the current turned on the tip is gradually moved so as to make a line through the diseased tissue, the process being repeated until a sufficient number of cautery lines have been made. Nabothian cysts are destroyed in a similar manner.

These manipulations are performed without an anæsthetic in his own office. Davis states that all his patients have been relieved. Among the symptoms relieved are dysmenorrhœa, dyspareunia, pelvic tenderness and pain, backache, menorrhagia, metrorrhagia and sterility.

The treatment of chronic gonorrhœa in women with the electric cautery. Shuthe states that after the acute stage of gonorrhœa in women has passed off the disease localizes itself in three gland structures, namely, the cervix, the paraurethral glands of Skene, and the glands of Bartholin. He cauterizes the cervix without anæsthesia; under novocaine he cauterizes the paraurethral glands, and under general anæsthesia he removes the glands of Bartholin, cauterizing the duct openings.

Shuthe claims that the advantages of this treatment far outweigh its possible dangers and difficulties, and affords a means of rapidly sterilizing the secretions; barring complications, patients can be assured a cure. He also states that the treatment removes infection at its origin, by removing the pathology and combines with this the destruction of the gonococcus in the tissues by the local elevation of temperature.

Management of occipito-posterior position. This is really a paper advocating the use of the Kjelland forceps, which the author describes. The following are the chief points:—

(1) The pelvic curve is less than in ordinary blades.

(2) The concavity of the pelvic curve is on a line with the handles of the blades.

(3) The lock-sliding arrangement permits accommodation.

(4) The connexion between the blades and lock is longer than in other models, and is round and narrow, so that the blades can easily be turned in the axis *in utero*.

(5) The internal surfaces of the blades are convex, a cushion-like effect producing less pressure and cutting than the ordinary models.

He also states that the forceps are applied much more easily than the ordinary forceps, especially in occipito-posterior positions. They are applied regardless of the position of the mother, but in relation to the sagittal suture of the fœtal head.

Pneumo-peritoneum as an aid in the diagnosis of obscure pelvic lesions and early pregnancy. Burch recommends the injection of CO_2 into the peritoneal cavity as an aid in X-ray diagnosis, passing the gas through the uterus and tubes in ordinary cases and through the abdominal wall by means of a puncture in cases of pregnancy. He thinks that he and McClure have discovered a pathognomonic sign of pregnancy *i.e.*, a much thickened uterine wall with a distinct cavity, and in this cavity a mass.

In conclusion the author says that the method is of the greatest aid in obscure pelvic cases, and will make an accurate diagnosis possible, and that it is possible to diagnose with certainty pregnancy in the early weeks, provided the pathognomonic sign is shown in the Roentgenogram.

The treatment of general peritonitis. This is a plea for witholding one's hand as much as possible, *i.e.* to deal with the cause of the infection as gently as possible, to pass a small soft rubber tube—not gauze—nearly but not quite to the bottom of the pelvis, place the patient in the Fowler position, and give saline per rectum, and withold food until the bowels move. The author seems to think that this is all that is required, and states that: "All patients with general peritonitis treated in this way will recover if the treatment is instituted before paralytic obstruction has developed."

A. SPONG.

American Journal of Obstetrics and Gynæcology.

May, 1925.

*Gangrene of the extremities following gynæcological operations and the puerperium—with remarks on embolectomy. A. Stein.

A new axis traction handle for solid blade forceps. A. H. Bill.

Combined radium therapy and operation in the treatment of cancer of the uterus. W. T. Dannreuther.

Histopathological changes in uterine carcinoma treated with radium. P. Klemperer.

Ovarian transplantation. I. Kross.

End-results with the Emmet-Baldwin operation for procidentia. G. Gibson.

Suggested bio-physical interpretation of cancer. G. W. Crile.

The treatment of inoperable cervical carcinoma with measured doses of X-rays and radium based on microscopic examinations. The five-year end-results. H. Schmitz.

Radiation therapy of carcinoma of the uterus. U. V. Partmann.

The rule of radium treatment of cancer of the cervix. T. E. Jones.

A newly-modified method for determining the area of the pelvic inlet by X-ray pelvimetry. H. Thoms.

*Insulin and glucose treatment of excessive vomiting of pregnancy. W. Thalhimer.

Three types of ureteral pathology with unusual clinical features.

Pseudocartilaginous cyst of the ovary. W. E. Darnall.

Rupture of the uterus with a report of two cases with recovery following hysterectomy. J. K. Quigley.

The short umbilical cord as a factor in dystocia. T. W. Adams.

A new uterine cannula for use in the Rubin test. E. Gladstone.

Collective Review—A review of the gynæcological literature of 1924. S. S. Schochet and J. E. Lackner.

Selected Abstracts—Diseases of the urinary tract.

June, 1925.

*The coincidence and interference of uterine tumours. O. Frankl.

Congenital polycystic kidneys. J. E. Davis.

*The relation of dysmenorrhœa to interstitial thyrotoxicosis as proved by therapeutic measures. A. E. Hertzier.

*A study of streptococci from chronic infection of the cervix uteri and Fallopian tubes. C. W. Barrett, A. F. Lash and I. Pilot.

Indications for, and the end-results of, the Sturmdorf operation. W. A. Coventry.

*Clinical similarity between eclamptic toxæmia and acute glomerulonephritis. R. D. Mussey.

*The relation of post-operative peritonitis to periodical epidemics of infection. R. R. Huggins.

A semicircular mattress suture of the vagina immediately following labour. R. S. Tilles.

Concerning the technique of the classical Cæsarean section. J. S. Lawrance.

Ethylene-oxygen in obstetrics. E. L. King.

Chronic infections in pregnancy. W. A. Fowler.

Observations on the Rubin test. T. R. Morgan.

A study of three hundred pregnant negro women having a four-plus Wassermann. J. R. McCord.
Weight during pregnancy with observations and statistics. C. R. Hannah.
Collective Review.—New Books. R. T. Frank.

July, 1925.

The function of the Hofbauer cells of the chorionic villus, particularly in relation to acute infection and syphilis. J. Hofbauer.
*A case of sympus dipus. An anatomical study. C. E. Proshek.
*The Kielland obstetrical forceps and its application. J. Jarcho.
Hæmorrhage in the last trimester of pregnancy. H. C. Burgess.
The use of mercurochrome in obstetrics. H. W. Mayes.
Four years' experience with radium in the treatment of gynæcological conditions. J. J. Mundell.
*The significance of the passage of meconium during labour. M. Schulze.
Clinical interpretation and importance of the fœtal heart sounds during labour. R. A. Bartholomew.
The danger of cervical erosion. P. J. Reel.
Some debatable features of curettage of the uterus. G. Gellhorn.
Prolonged and shortened gestation periods from medical and medico-legal standpoints. L. C. McCaffrey.
*Bandl's ring as a cause of dystocia with a report of four cases. W. A. Michael.
A series of deaths in gynæcological patients. R. A. Hurd.
Collective Review.—Treatment of cancer of the cervix. Shall it be radium or operation? J. O. Polak and G. W. Phelan
Selected Abstracts.—Physiology and pathology of menstruation.

Gangrene of the extremities following gynæcological operations and the puerperium—with remarks on embolectomy. Puerperal gangrene due to embolic obstruction to main arteries has been known to follow many operations of different types. Stein—the author of the present paper—collected all the published cases in 1916. In the present article he has brought the recorded cases up to date and describes in detail the operation of "embolectomy." He hopes that the early removal of the occluding clot from the vessel may hold out some faint hope of saving the limb when this desperate complication has arisen.

Insulin and glucose treatment of excessive vomiting of pregnancy. Thalimer here records two more successful cases of severe toxic vomiting of pregnancy treated by his insulin and intravenous glucose method.

In the interesting discussion which followed this paper which was read before the New York Obstetrical Society, reference was made to the occasional occurrence of sudden death during or immediately after intravenous injections of glucose solutions. Dr. Thalimer, in his reply, referred to two cases of collapse following glucose injections which were apparently caused by contamination with camphor. He rejects all glucose solutions for intravenous injections if the autoclaved solution shows the slightest trace of colour.

The coincidence and interference of uterine tumours. Prof. Oskar Frankl's study of nearly two thousand cases of myoma (1,878), sarcoma (38) and of

combined sarcoma and carcinoma (8) is not one which lends itself to abstraction. He finds support in his figures for some of his conceptions as to the origin of both the simple and the malignant tumours. He concludes by saying of his paper that if he has only given some data for comparison and further investigations the purpose of his work has been fulfilled, and he has certainly done much more than attain this modest goal.

The relation of dysmenorrhœa to interstitial thyrotoxicosis as proved by therapeutic measures. "This essay undertakes to segregate endocrine disturbances of the ovary with the type of goitre called interstitial. It furthermore undertakes to select the primary disturbing factor and by correcting this to secure relief for the disturbances caused by such deviation from the normal in each of these." The author takes a wide view of the symptomatology and physical signs of thyroid disease. He treats the patient with small doses of potassium iodide and is utterly opposed to operation for the associated dysmenorrhœa.

A study of streptococci from chronic infection of the cervix uteri and Fallopian tubes. The author has found that streptococci were present in 40 per cent. chronic infections of the cervix and in 35 per cent. of the chronic infections of the Fallopian tubes. There appears to be no relationship between the incidence of their infections in the cervix and the tubes. The bacteriological findings are to be correlated with the clinical symptoms and the author's promise to present their results at a later date.

The clinical similarity between eclamptic toxæmia and acute glomerulo-nephritis. Mussey, in this article from the Mayo Clinic, calls attention to the similarity between pre-eclamptic toxæmia and acute glomerulo-nephritis. The subdivision of parenchymatous nephritis into glomerulo-nephrosis and glomerulo-nephritis is of recent origin and has not been before applied to the renal lesions of pregnancy. In the former and less serious condition the characteristics are albuminuria and œdema but normal blood nitrogen and blood pressure. Glomerulo-nephritis, on the other hand, is the condition in which in addition to albuminuria and œdema there is hypertension and hæmaturia.

The author's conclusions are founded upon clinical and bio-chemical studies of 12 cases of toxic albuminuria of pregnancy, but, as none of the patients have died, he has no histological data in support of his views.

The relation of post-operative peritonitis to periodic epidemics of infection. The terrible experience of having lost six "clean" abdominal cases from streptococcal peritonitis has led Higgins to believe that there is a relationship between this post-operative complication and the influenza epidemics of the past six years. All the patients gave a history of having suffered from influenza at a longer or shorter interval before the operation. He suggests that the streptococci may lurk in such places as the gall-bladder, lymph-spaces or in the blood itself, and, in support of this, he refers to the cases of occasional and unexplained thrombophlebitis of the legs.

A problem which the bacteriologists might be able to decide is whether the influenza bacillus lessens the resistance of the patient or stimulates the

virulence of the streptococci. An interesting feature of this study is that 80 per cent. of the deaths from peritonitis occurred in the first quarter of the year. [Cf. The peak of the puerperal sepsis curve.]

A case of sympus dipus: an anatomical study. Teratological studies of monsters are complicated by the extensive terminology which has become necessary to define the various abnormalities. Proshek, in this article, describes a case of "sympus dipus" which is a monster which closely resembles a mermaid. The two lower limbs are fused into one. He has collected records of eight similar monstrosities.

The Kielland obstetrical forceps and its application. Julius Jarcho writes in support of the use of these forceps in place of the usual type with the pelvic curve. He finds that with them and episiotomy the axis-traction instrument is unnecessary. There is no injury to the baby's head other than a possible facial paralysis, and there is less damage to the maternal soft parts. It is essential that a correct diagnosis of the position of the fœtal head shall be made prior to their application. It is apparent that Jarcho realizes that the Kielland forceps are more difficult to apply and more dangerous in use than the classical type. He lays stress upon the necessity of careful instruction in the use of the instrument before any attempt is made to apply it in actual practice.

The significance of the passage of meconium during labour. Seeking to estimate the true value of this phenomenon as a sign of fœtal distress Margaret Schulze has studied its frequency and significance in a series of 5,534 cases. She found that of the 182 cases 86 had the liquor amnii stained with meconium at the time of rupture of the membranes; in 61 the meconium appeared only after rupture of the membranes but before the birth of the child, while in the remaining 35 the amniotic fluid following the child was discoloured. As a result of this study the authoress considers that the passage of meconium by the child during labour is, in the majority of cases, entirely independent of fœtal asphyxia. Fresh meconium appearing after other signs of fœtal distress is, however, a frequent sign of grave asphyxia and the child may perish in spite of rapid delivery.

Bandl's ring as a cause of dystocia with a report of four cases. Michael does not think that the contraction ring is a localized spasm of the uterine musculature as described by Clifford White. The term "persistent retraction ring of Bandl," is suggested for the cases which, in addition to the ring, have general uterine retraction; while those in which Bandl's ring alone exhibits contraction should be named "Tonic contraction ring of Bandl." Michael considers that the adoption of these terms to designate the respective clinical syndromes will accomplish much in placing the entire subject on a more rational basis. The author does not offer much help in either the diagnosis or treatment of this complication of labour but he appears to rather condemn Cæsarean section and to prefer craniotomy. It is interesting to note that three out of the four cases which he records had been treated with pituitary extract, and it is permissible to speculate as to the causal relationship between the use of this drug and the "contraction ring."

W. W. KING.

The Journal of the American Medical Association.

January 10, 1925.

Arthritis of the menopause. A study of 50 cases. R. L. Cecil.

End-results of the treatment of cervical carcinoma with radium and Roentgen rays. H. Schmitz.

Heredity and rickets. (Editorial.)

January 17, 1925.

*Human milk : its commercial production and distribution. B. R. Hooker.

January 31, 1925.

Testing patency of Fallopian tubes—findings in thirty cases. R. T. Ferguson.

Skin reactions with gonococcus filtrates (toxin ?). R. D. Herrold.

February 7, 1925.

Prevention of congenital syphilis by treating the mother during pregnancy. J. S. Lawrence.

*Most favourable time for trans-uterine insufflation to test tubal patency. Advantages of the post-menstrual phase. J. C. Rubin.

March 14, 1925.

Low or cervical Cæsarean section (laparotrachelotomy). Three hundred and thirty operations with two deaths. J. B. De Lee.

April 11, 1925.

*Cullen's sign in conditions other than extra-uterine pregnancy. R. Kapsinow.

April 25, 1925.

Spontaneous recurrent abortion : an inquiry into the causes and preventitive treatment. A. H. Curtis.

May 9, 1925.

Family neuro-syphilis. J. E. Kemp.

*Physostigmine in abdominal distension. H. E. Martin and S. Weiss.

May 23, 1925.

*Primary syphilis of the ano-rectal region. E. Martin and H. I. Kallet.

June 6, 1925.

The female sex hormone and the gestational gland. R. T. Frank and R. G. Gustavsm.

June 13, 1925.

Insufflation of Fallopian tubes. G. L. Moench.

June 20 1925.

Malformation of vagina obstructing labour. L. E. Phaneuf.

June 27, 1925.

Puerperal fever : streptococcus hæmolyticus toxin. A. F. Lash and B. Kaplan.

Human milk: its commercial production and distribution. Hooker tells how he has been able to arrange for a constant supply of human milk in containers, and so replacing the wet nurse. At present the price works out at 15 cents per oz. He is able to obtain his producers by advertisement in the daily press, and before accepting them they must come up to the following rigid standard :—

(1) Be healthy and have a negative Wassermann reaction and be free from tuberculosis.

(2) Have clean personal habits.

(3) Live in a clean home.
(4) Nurse their own healthy babies up to eight months.
(5) Express milk at least twice daily.
(6) Keep milk in ice until delivered.
(7) Supply at least 16 oz. daily.

The paper gives details of ten years' observations. The author states that at present there seems to be no satisfactory substitute for breast milk at an early age, particularly if the infant is a weakling, and he thinks that there seems to be no better way to reduce the mortality of this early period of life than to increase the production of human milk. The milk is expressed from the breasts. Probably nothing of this kind has ever been attempted in England, and it is doubtful whether there is any demand for such a scheme. It is also very doubtful whether he is right in his conclusions above-mentioned, and whether other less risky and more efficient substitutes are not available.

Most favourable time for trans-uterine insufflation to test tubal patency. Rubin states that the most favourable time in which to insufflate the uterus for the purpose of testing tubal patency is from the fourth to the seventh day following the cessation of the last regular period; the endometrium is stated then to be in a relatively quiet stage, and is least liable to infection. He draws his conclusions from an analysis of 1,000 consecutive insufflations. A pressure of from 200 to 250 m.m. of mercury must not be exceeded.

Cullen's sign in conditions other than extra-uterine pregnancy. Kapsinow states that the bluish-black appearance about the umbilicus, unassociated with any history of injury, together with a definite uterine history usually typical of the slow tubal abortion type of bleeding, is considered a positive sign of ectopic pregnancy. He draws attention to the fact that Novak mentions that other conditions of intra-abdominal hæmorrhages due to causes other than extra-uterine pregnancy may possibly cause this umbilical discolouration.

Kapsinow then describes a case of sarcomatous growth of the peritoneum following a sarcoma of the right kidney, in which this sign (Cullen's) was present.

Physostigmine in abdominal distension. Martin and Weiss conclude that physostigmine is a useful drug for the treatment of abdominal distension in non-toxic cases especially, but that it is less useful in cases of the toxic type. They consider that the drug has fallen into disuse mainly because of the employment of insufficient doses, and suggest doses from one-twentieth to one-sixteenth of a gram of the salicylate or benzoate repeated once after an hour and three times at intervals of three or four hours.

Primary syphilis of the ano-rectal region. The authors find that primary syphilis of the ano-rectal region is by no means uncommon, and that the chancre is accompanied early by a dermatitis and condyloma formation that distinctly modify its appearance. The presence of a moist condyloma should suggest syphilis.

Insufflation of the Fallopian tubes. The author is of opinion that carbon-dioxide insufflation of the Fallopian tubes is a valuable and safe test when

properly carried out, but he admits that morbidities and mortalities have occurred, and that the test should be used only when indicated.

He states that fluoroscopic examinations are not essential to prove that the gas has entered the peritoneal cavity, which can be determined by sphygmomanometer reading and the "shoulder pains." He also thinks that the therapeutic value of the Rubin test is small but real, as shown by the fact that the tubes, after several carbon-dioxide insufflations, often become more patent than before. A. SPONG.

La Gynécologie.

April, 1925.

*Metrorrhagia in young girls. A. Sireday.

*Stomatoplasty by complete commissural division of the cervix in the treatment of cervical stenosis. C. Daniel.

A case of uterus didelphys. E. van Erps.

May, 1925.

*Adeno-fibromatosis, partly cystic and partly polypoid, of the endometrium, with early carcinomatous transformation in the cervix. Reeb.

*Diverticular tubal pregnancy. Riotte.

*The present position of organotherapy in gynæcology: its scientific basis and its results. G. Schickelé.

June, 1925.

*The scruples of the gynæcologist concerning chronic appendicitis. G. Schickelé.

*On appendicitis, chronic from the beginning; its differential diagnosis in the female and treatment. J. Kreis.

*Intestinal obstruction and pregnancy. Puerperal pseudo-ileus. R. Keller.

*On some cases of infected ovarian cyst. P. Burger.

July, 1925.

*The value of a small bilateral cuneiform excision of the cervix, without sutures, in the treatment of dysmenorrhœa and sterility associated with congenital malformation of the uterus. P. Petit-Dutaillis.

A case showing the importance of blood-pressure observations in gynæcology. J. Abadie.

Metrorrhagia in young girls. The slight discharge sometimes noticed in new-born female infants is briefly dismissed, as also that in little girls from 3 to 10 years old, the latter being really due to a hæmorrhagic vulvitis. Excessive bleeding most commonly begins at puberty. The menorrhagic form indicates a functional disorder, usually due to the state of the general health; irregular and prolonged bleeding is related to organic changes in the endometrium, uterine parenchyma or appendages: this distinction is not, however, absolute.

Uterine hæmorrhage may be the first symptom of mitral stenosis. It may occur in nephritis, familial jaundice, enterocolitis, and chronic appendicitis. It may be due to delayed coagulation of the blood. It may be the result of nervous instability. Graves's disease causes increased loss: thyroid insufficiency generally leads to amenorrhœa, but the slighter forms may be associated with hæmorrhage. Tuberculosis and congenital syphilis are

responsible in some cases. There is a residue in which the bleeding is a purely functional disturbance unassociated with changes in any other organ.

Organic changes in the pelvic organs are commoner than is generally believed : they are often overlooked on account of the difficulty in making a satisfactory local examination. Myoma occasionally begins between 15 and 20. Carcinoma is known although it is very rare. Sarcoma takes the racemose type. Much more frequent are villous endometritis and mucous polpi.

In dealing with these cases any medical condition should receive appropriate treatment. It is of capital importance to insist on complete rest in bed during the duration of the discharge : the " essential hæmorrhages of young girls " usually cease after rest during two or three menstrual periods. In grave cases, ice-bags or injections of hot water may be used. Ergot, hamamelis and pituitrin are sometimes successful.

The failure of the above measures implies the presence of some organic disease, and indicates the necessity for a complete examination followed by curettage. Recurrence of the trouble after curettage may be treated with radium in small doses—six or seven millicuries. Major operations may be needed very exceptionally.

Stomatoplasty by complete commissural division of the cervix in the treatment of cervical stenosis. The writer says that Pozzi's operation as usually performed sometimes results in cicatricial changes at the internal os, and the last state may be worse than the first. He has extended the operation so as to enlarge the internal os as well as the external. The incision on each side of the cervix extends 2 to 3 cms. on the vaginal aspect, while internally it extends another centimetre. A prismatic strip of tissue is removed on either side, including the commissure, and the raw surface is closed by stitches passing from side to side. It is claimed that this operation results in a widely-open cervix which allows free dainage of the uterine cavity and favours impregnation. It is not stated whether there is any tendency to abortion.

Adeno-fibromatosis, partly cystic and partly polypoid, of the endometrium with early carcinomatous transformation in the cervix. The patient, 49 years of age, complained of a profuse leucorrhœal discharge before and after the menses, which were regular. The uterus was found enlarged to the size of a four months' pregnancy. A diagnosis of fibroid was made and operation was not at first advised on account of her approaching menopause and because of a serious mitral lesion.

Two months later, the discharge having increased and become tinged with blood, operation was undertaken. Supravaginal hysterectomy was done, and as the cervix was seen to be unhealthy it was removed also.

The increased bulk of the uterus was caused by a general thickening of the muscular wall, and by a large adenomatous hyperplasia of the endometrium which attained a thickness of 3 to 4 cms. A fibrous stroma supported a mass of glandular tissue of roughly normal type. In the cervix was an isolated vegetation in which the epithelium had not kept its benign character, but showed clear evidence of malignancy.

Diverticular tubal pregnancy. In this case the products of gestation were found in a diverticulum which extended for some dist nce in the wall of

the tube. The diverticulum was lined in a considerable part of its extent with epithelium, thus showing that it had been pre-formed and was not merely the result of erosion by the trophoblast. It was not a developmental abnormality, but the result of old inflammatory disease : there were several other small diverticula with a mass of fibrous tissue (salpingitis isthmica nodosa). Diverticula have often been invoked as a cause of tubal pregnancy, but such a clear demonstration has seldom been given.

The present position of organotherapy in gynæcology: its scientific basis and its results. In this judicial article, Schickelé gives the results of his ten years personal experience, experimental and clinical, with alcoholic extracts prepared by himself in Hofmeister's laboratory of physiological chemistry. He points out that, of all the hormones, the exact chemical constitution is known only in the case of adrenalin and perhaps thyroidin. In the case of the ovary, there is evidence showing that the lipoids play an important part, but similar results can be obtained with extracts free from lipoids.

Results supposed to show a specific ovarian action—hyperæmia, growth and stimulation of the uterus, vagina and mammary glands—are produced, not exclusively by ovarian extracts, not even by extracts of endocrine glands only, but also by extracts of other organs. He finds that, in the vaso-motor troubles of the menopause, equivalent results are produced by extracts of entire ovary, corpus luteum, testicle, placenta, uterus, fibromyoma and mammary glands.

The high blood-pressure, which he estimates to be present in 50 per cent. of women after the menopause, is very resistant to this kind of treatment. Kraurosis is definitely benefited by extract of corpus luteum. In three cases of sterility associated with hypoplasia of the uterus a cure has followed the use of ovarian extract. He has had occasional successes in cases of amenorrhœa due to imperfect development, but with different extracts.

He cites a case which forcibly impressed those who had the opportunity of observing it. A man, suffering from typical myxœdema, was treated with thyroid extracts for some time without benefit. A portion of fresh human thyroid gland was then transplanted under the skin, with good results for some months, but the symptoms returned as at first. He was then given extracts of uterus, with good success, so that after treatment lasting three months he remained well for a year. Another relapse was treated with extract of ovary, which proved best of all!

Schickelé believes it is time to disentangle our ideas from the unreliable suggestions in which they have become enmeshed. The specificity of organo-therapy, such as we are supposed to practise it, with the help of the preparations found in commerce, has never been proved. It is certainly not a treatment by substitution, comparable with the implantation of the living tissue of an endocrine gland, such as the ovary or the thyroid. The laboratories which prepare the products of the so-called organotherapy would perform a signal service by improving their technique and by producing less.

The scruples of the gynæcologist concerning chronic appendicitis. Constipation with all its consequences is very common in the female. The symptoms supposed to indicate chronic appendicitis are often due to

intestinal atony or ptosis or to entero-colitis. Hence removal of the appendix often fails to cure. It is urged that a more thorough investigation should be made in such cases—including a radiological examination of the intestinal tract and a pathological examination of the stools.

Should the appendix be removed on principle when it is exposed during a gynæcological operation? It is established that internal lesions may be present without any change in the outward aspect of the appendix; therefore it is best removed when this can conveniently be done without increased risk to the patient.

When it has been decided to remove the appendix for chronic appendicitis it is well to make an incision which will allow examination of the pelvic organs at the same time. Schickelé recommends the transverse suprapubic incision.

On appendicitis, chronic from the beginning; its differential diagnosis in the female and treatment. In women the diagnosis is specially difficult because of the possibility of affections of the internal genital organs. There has been a tendency to leave the precise diagnosis to be determined at an operation, but Kreis does not approve of this. Every possible method of investigation should be employed in doubtful cases, and the result of a course of medical treatment observed. The gynæcologist should be on his guard against bias in the direction of his own speciality. The two affections may occur concomitantly, and either may be the primary one.

Intestinal obstruction and pregnancy. Puerperal pseudo-ileus. Obstruction caused directly by pregnancy is very rare; more commonly the causation is indirect.

A case is described in which a long loop of sigmoid became compressed between the fœtal head and the sacral promontory. Cæsarean section was done. In this case the uterus was normal. Obstruction is more liable to happen when the pregnant uterus is retroverted or when the pregnancy is complicated by a myoma or ovarian tumour.

Pregnancy acts as a secondary cause of obstruction when adhesions or bands are present. This is particularly likely to happen when the meso-sigmoid is adherent to the left broad ligament. As the uterus ascends during the latter part of pregnancy, the sigmoid is liable to become kinked. Volvulus of the sigmoid may also be induced by the altered relations in pregnancy.

Two cases are described in which all the symptoms of acute intestinal obstruction arose in the first few days after delivery. One was relieved by an enema: the other needed laparotomy and typhlotomy, but no mechanical cause of obstruction was found.

On some cases of infected ovarian cyst. The following points are brought into prominence:—

1. The puerperium is the time most favourable for infection of an ovarian cyst.

2. The symptomatology is indefinite. The classical symptoms—pain, tension, increase in size, pyrexia and cachexia—may all be lacking: on the other hand the symptoms may be so acute and fulminating as to confuse the diagnosis of the cyst itself. Again, a confident diagnosis based on all the classical symptoms may turn out to be wrong, as in one of Burger's

cases in which the condition was a suppurating myoma of the uterus. For these reasons the diagnosis is almost always difficult and usually one of probability only.

3. The conditions needing to be differentiated are other cystic abdominal tumours, ascites, and soft necrotic or infected fibroids.

The value of a small bilateral cuneiform excision of the cervix, without sutures, in the treatment of dysmenorrhœa and sterility associated with congenital malformation of the uterus. Some writers (Douay, Daniel) have extended Pozzi's operation so as to effect a permanent enlargement of the internal os. This, however, leads to serious risk of abortion. The small operation described is free from this risk and gives results at least as good. After dilatation of the cervix a wedge-shaped piece is removed on either side, the base of the wedge being at the margin of the external os, and the portion removed extending no more than 1 cm. The result is a bilabial cervix resembling that found after a normal accouchement.

A. Gough

REUNION OBSTETRICALE DE LILLE.

Results of treatment of chronic endocervicitis by Filho's caustic. H. Paucot.

Cæsarean hysterectomy for dystocia in a contracted pelvis; infected uterus; recovery. Picard.

Cæsarean section for "shut pelvis." H. Paucot.

A case of placental tumour. Bué, Bëghin and Houcke

Histologically a true capillary angioma.

REUNION OBSTETRICALE DE LYON.

Prolonged retention of dead ova. Albertin.

Missed abortions retained to (*a*) term and (*b*) seven months.

Puerperal infection of the mother. Fatal streptococcal pyæmia with multiple abscesses in the fœtus at tenth day. Gonnet and Morel.

Velamentous insertion of cord. Division of three vessels by rupture of the membranes. Gonnet and Morel.

Artificial rupture of membranes, birth of living infant.

Cardiac malformation: inter-ventricular communication without stethoscopic signs in a full-term fœtus. Gonnet and Morel.

Uterine rupture treated by simple packing. Cure. Voron, Bouvier and Banssillon.

Extensive hæmatoma of the scalp in a neonate. Eparvier.

Hæmorrhage into the suprarenals in a neonate. Commandeur.

Contracted (oblique) pelvis due to unilateral lameness (following enteric at three years of age). Gaucherand.

REUNION OBSTETRICALE DE MONTPELLIER.

"Pelvis comparer" of Henri. Guerin-Valmale and Henri.

A piece of wood having three sides cut out in (nearly) semicircles of 12, 10 and 14 cm. diameter to enable students to attain familiarity with the curvature of normal, flat and generally contracted pelves, respectively.

Pregnancy after purulent collection in the pouch of Douglas had been incised and drained. Tédenat.

Hydrocephalus, after-coming head so large as to be mistaken for second twin. Madon.

Late Cæsarean hysterectomy after two forceps applications. Guárin-Valmale and Dias.

Dermoid cyst complicating pregnancy: Cæsarean section and removal of cyst. L. Vallois and de Rouville.

Squamous epithelioma of cervical canal (specimen). De Rouville.

Breast anomalies. Guérin-Valmale and Dias.

Two cases (*a*) supernumerary rudimentary breast, (*b*) supernumerary full-sized nipple on one breast.

Obstetrical uses of radiography. Radiographs of fœtus and of pelvis. Lemarque and Roume.

Obstetrical analgesia by hæmypnal, based on 42 new observations. Guérin Valmale and A. Rathelot.

Complete failure in 33; successful in six.

Vascular tumour of the vagina with syncytioma, death from pyæmia. De Rouville, Madon and Guibal.

Concerning obstetrical anæsthesia by urea derivations. Paul Delmas and Roume.

These writers were not favourably impressed by somnigene or allonal.

REUNION OBSTETRICALE ET GYNÆCOLOGIQUE DE NANCY.

Late complications of a Doléris operation. G. Michel.

Owing to faulty operating a loop of small intestine had been drawn along with the round ligament; intestinal obstruction; development of small intestinal fistula with its usual train of manifestations; eventual repair and recovery.

Successive bilateral extra-uterine pregnancy. A. Guillemin.

Some further observations of Naegele pelves. A. Fruhinsholz and Husson.

SOCIETE D'OBSTETRIQUE ET DE GYNÆCOLOGIE DE STRASBURG.

Fibroid treated by deep radio-therapy without success, subsequently operation. Schickelé.

Note on rate of growth of a fibroid. Schickelé.

Post-partum hæmorrhage caused by fibroid; hysterectomy. Fleurent.

Suppurating interstitial fibroid in the puerperium. R. Keller.

Diffuse adeno-fibromatosis of the uterine mucosa, partly cystic, partly polypoid; with commencing carcinomatous change in the cervix. Reeb.

Fibroma of hymen. A. Riotte.

Tubal abortion and profuse intraperitoneal hæmorrhage. A. Riotte

R. A. HENDRY.

Bulletin de la Société d'Obstétrique et de Gynécologie de Paris, etc.

No. 8, 1924.

SOC. D'OBST. ET DE GYN. DE PARIS.

Radical cure of an exomphalos. M. Briand.

Placenta prævia, rupture of uterus, hysterectomy, cure. M. Lantuéjoul.

Two cases of Cæsarean sections with temporary exteriorization of the uterus. M. P. Berson.

Two cases of acute yellow atrophy of the liver during pregnancy. G. Marondis.

Cancer of the cervix treated by radium. Subsequent hysterectomy (five months later). A. Papointe.

The association of surgical treatment and radium-therapy in the treatment of uterine cancer. Adjourned discussion by J.-L. Faure, J. Gagey, A. Lapointe, Hartmann, A. Siredey.

SOC. D'OBST. ET DE GYN. DE BORDEAUX.

Radiography of triplet pregnancy at six months. Favreau and Despons.

*Cæsarean operations and phlebitis. M. Rivière, Favreau and Despons.

Three cases of " white leg "—one bilateral—in five sections.

Cæsarean section and hysterectomy for a " prævial " fibroid. Anderodias, Laconture and Boursier.

A case of severe uterine hæmorrhage caused by a small parovarian cyst in the broad ligament. Pery, Boursier and Mangé.

Necrobiosis of a large uterine fibroid with exposure in the uterine cavity. Loubat, Mangé and Bernard.

Face presentation, contracted pelvis, Cæsarean section. Anderodias and Laconture.

Two fatal cases of eclampsia. Rivière, Favreau and Despons.

Cancer of the uterine body and X-rays. Bégouin.

A new case of unicorn uterus with unilateral absence of appendages. Laconture and Marc Rivière.

On a case of fibroid and pregnancy. Maurice Rivière and Laconture.

SOC. D'OBST. ET DE GYN. DE LILLE.

Laparotomy during pregnancy. E. Decherf.

Therapeutic abortion for severe vomiting and jaundice. Bué and Béghin.

*Hysterotomy for retroplacental hæmorrhage at the fourth month. Bué and Paillez.

In the text, laparotomy at sixth month on mistaken diagnosis of fibroid and pregnancy. As hæmorrhage had been severe on several occasions, hysterotomy was performed and the uterus emptied.

Porro operation for neglected shoulder presentation. Duvillier and Béghin.

*Cæsarean section for over-size of fœtus. A. Paquet.

Unrecognized hydrocephalus, Porro operation.

*Delivery in an ilio-femoral pelvis. E. Klein.

Obliquely contracted pelvis secondary to congenital dislocation of one hip.

False inclusion of the pregnant tube in the broad ligament. J. Vanverts.

Hæmatocele due to intra-ligamentary rupture of tubal pregnancy. H. Paucot.

A true pelvic hæmatoma.

Imperforate vagina : hæmatocolpos and hæmatometra. Derraux.

Treatment of chronic cervical infections by Filhos caustic. Vanverts.

SOC. D'OBST. ET DE GYN. DE LYON.

Concerning a case of congenital localized atrophy of the scalp and of the parietal. Commandeur and Rhenter.

Pyelonephritis and uræmia. Voron and Charleux.

Klippel-Feil syndrome and contracted pelvis. Voron and Charleux.

Large fibroid with low implantation; manual reduction (to abdomen) near term; delivery *per vias naturales*. Voron and Ducroux.

Large submucous fibroid: delivery at seven months: spontaneous expulsion of fibroid two days after labour. Voron and Rucroux.

Intrauterine fibroid polyp and pregnancy; abortion at three months; gangrene of the polyp. G. Cotte.

*Prolonged retention of ova dying in the early months of pregnancy. Planchu.

Two of the four cases recorded were retained for two months beyond term.

Concerning placenta prævia. Rhenter.

Embryonic umbilical hernia cured by operation 12 hours after birth. A. Rendu.

Obstetrical shock following digital curettage in the puerperium. Gaucherand.

Twin pregnancy; fœtus papyraceus; extensive congenital cutaneous lesions in the surviving twin. Voron and Bouvier.

Puerperal infection and hysterectomy; death. Voron, Bouvier and Charleux.

*Attempt at treatment of hydramnios by intravenous hypertonic injections. Commandeur and Bassillon.

Not a very severe case and doubtful benefit.

SOC. D'OBST. ET DE GYN. DE NANCY.

Concerning late high-seated pain in rupture of tubal pregnancy. Ch Mathieu and J. Guibal.

Gum saline in obstetrics and gynæcology. M. Barthélemy.

Abdominal pregnancy. Vautrin.

Putrid infection of hæmatocolpos secondary to appendicitis. Binet.

Hemiplegia in "lying-in" women. Fruhinsholz and François.

Ruptured interstitial gestation; blood transfusion; cure. A. Guillemin.

Abortion: perforation of posterior fornix; vaginal hysterectomy; intestinal obstruction (recovery). Job, Hamant and Ch. Mathieu.

Dystocia due to vaginal septum. Delfourd and Riff.

Genital tuberculosis and pregnancy. Fruhinsholz and Feuillade.

SOC. D'OBST. ET DE GYN. DE STRASBOURG.

Dystocia due to œdema of cervix. Burger.

Rupture of lutein cyst simulating rupture of tubal gestation. Burger.

Paralysis of arm (Duchenne-Erb type) in a nursling after spontaneous delivery with head presentation. Ginglinger and Morin.

*Bilateral salpingo-öophorectomy and persistence of menstruation. Reopening of abdomen. Kreis.

Portion of one ovary had been left behind—presumably in separating adhesions—later on it became cystic.

Expulsion of intact ovum at the end of the seventh month; living infant. Jacques.

Dystocia due to new growth of rectum. Bindschedler.

Pyelonephritis of pregnancy; simulating septicæmic development. A Riotte.

Concerning some types of vaginal malformations; transverse partition,

imperforation of hymen. Symptomatic peculiarities in hæmatocolpos. G. Ferry.

Tubal pregnancy of third and fourth months. Schickelé.

Painful abdominal crises in a pregnant woman with a movable colon. E. Vaucher.

Concerning the treatment of uterine hæmorrhage by application of X-rays on an indifferent portion of the body. Kreis and Wolf.

Vaginal ulceration accompanied by severe hæmorrhage following treatment by neo-filhos. Reeb.

Perforation of pyosalpinx followed by peritonitis operated on within 12 hours of its onset. Reeb.

Large cystic tumour of left ovary obstructing labour; conservative Cæsarean section at term; ovariotomy; cure. Keller.

Repeated hæmorrhages from cervical stump after subtotal hysterectomy for fibroids; removal required. Ricotte.

No. 9, 1924.

SOC. D'OBST. ET DE GYN. DE PARIS.

Two facts proving the necessity of not limiting investigations to radio-pelvimetry: advantages there would be in settling the problem of radio-cephalometry (fœtal) at the end of pregnancy and during labour. L. Bouchacourt.

Discussion by Wallich, Couvelaire, Guéniot and Bouchacourt.

Delayed development of one or two ova, in a case of binovular twins, suggesting the existence of superfœtation. V. Cathala and G. Barbaro.

Trial of blood transfusion in premature weaklings. Guéniot and Séguy.

Temporary eventration of the uterus in Cæsarean section, replaced in the abdomen at the 45th day. Guéniot.

Four observations of Cæsarean section followed by temporary eventration of the uterus. L. Cleisz.

Tubal insufflator to demonstrate the patency of the Fallopian tubes. E. Douay.

Complication following fixation of the uterus to the abdominal wall by means of the round ligaments. Auvray.

Round ligament suspension following Doléris' technique; tube had been drawn in with ligament, become kinked and developed into a small painful tumour four years later necessitating operation.

Suppurating cyst of vagina of Wolffian origin, opening into the urethra (false urethrocele). Auvray.

A case of triplets. L. Cleisz.

SOC. D'OBST. ET DE GYN. D'ALGER.

Rare congenital vulval malformation. Persistence of cloacal membrane hiding completely the vaginal orifice and hymen. Pregnancy, natural delivery after excision of membrane. J.-M. Rouvier and Jahier.

Syphilis and pregnancy. Treatment by bismuth. Failure. Pouget.

Eclamptic fits started by injection of pituitary extract. Pouget and Gautier.

Note on the use of pituitary extract in uterine subinvolution. Pouget.

SOC. D'OBST. ET DE GYN. DE MONTPELLIER.

Histological examination of a Cæsarean scar. Guérin-Valmale and Caudière.

Case of tubal abortion (specimen). De Rouville and L. Vallois.

Diagnosis of fœtal death by the coagulation time of the maternal blood. Th. Guironden.

Fibroma of the right broad ligament with sarcomatous degeneration. De Rouville.

Dystocia by rigidity of the cervix due to new growth. L. Vallois.

Cæcal metastasis of mixed tumour of both ovaries; with gross prevertebral cancerous Wolffian adenopathy. De Rouville and de Carréra.

Cæsarean section for physometra with tonic contraction of the uterus during labour. L. Devèze.

Enormous ovarian cyst; ovariotomy; death on third day due to partial volvulus of intestine. De Rouville and de Carréra.

Local treatment in puerperal infection. P. Delmas.

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SOC. D'OBST. ET DE GYN. DE PARIS.

Discussion on the communication of M. Guéniot:—Trial of blood transfusion in premature weaklings. Ch. Dévé.

Pedunculated thrombus of the vagina. G. Barbaro.

*Concerning the treatment of severe pyelonephritis of pregnancy by the compound anti-B. coli vaccine of Fisch. Le Lorier and Fisch.

*Note on a severe pyelonephritis with retention during pregnancy, successfully treated by bladder distension and oral administration (vaccination) of B. coli; spontaneous premature delivery of 1700 gram infant. Le Lorier.

The vaccine referred to consists of (*a*) B. coli heat killed, (*b*) filtrate through Chamberland filter, and (*c*) a bacterio-lytic principle (bacteriophage) prepared by method described by Potochir and Fisch recently.

Concerning pelviotomies: the preliminary passage of the Gigli saw before extraction of the after-coming head in moderate pelvic contractions. Cathala.

Lesions of the bladder in cancer of the uterus, before and after radium-therapy, analysis of 200 cases. R. Gouverneur and S. Fahre.

New insufflator, filtering aspirator-insufflator. La Burthe.

*Unusual evolution of extra-uterine gestation, delivery *per vias naturales* at term of living infant, profuse third stage hæmorrhage causing death. R. Vaudescal.

Delivery apparently through incision in pouch of Douglas. Ectopic site recognized on examination for delay in third stage; laparotomy: death.

Cæsarean section with temporary eventration of uterus. Discussion of technique and results. Vaudescal.

May Mickulicz tampon drainage be preferable to temporary eventration in infected or suspect Cæsarean sections? P. Guéniot.

Vol. xi, No. 1, 1925.

*Uterine fibroids and ovarian tumours in old women. Tixier and Pollosson.

The authors in their preamble limit themselves to malignant ovarian tumours; seven cases are quoted; some of the cases were apparently not

confirmed histologically, and one appeared to be an ovarian fibroma with twisted pedicle.

*Hemiplegia in the puerperium. Fruhinsholz and François.

Twelve cases are analyzed; the authors report that there has usually been interference with the labour carrying increased risk of sepsis; that the right side is usually affected, nine cases in eleven, and in six of these nine there was aphasia; that the probable cause is an embolus but that as the cases usually recover (only one death in 11 cases) proof is necessarily lacking.

*Contribution to the history of Cæsarean section. Gall.

Concerning the priority of performing Cæsarean section before rather than after the maternal death; the writer considers that Rodericus a Castro (1603), whom he formerly believed to be the first to mention Cæsarean section on women *in extremis*, did not actually perform such operation, and gives priority to Charles Estienne, a French surgeon, who published his work, " De dissectione partium corporis homini," in 1545.

*A placental teratoma. Morville.

Possibly one of uniovular twins closely associated with the fœtal surface of the placenta.

The treatment of uterine fibroids. H. Gromadzki.

The implantation (grafting) of the ovary in the uterus. H. Hartmann.

TRANSACTIONS OF THE BELGIAN SOCIETY OF GYNÆCOLOGY AND OBSTETRICS.

The cases of delivery in women who have previously had vaginal Cæsarean sections for eclampsia. P. Firket.

Statistics of the antisyphilitic clinic at the " Maternité " of Antwerp. J.-L. Henrotay and van Nuffelen.

Twin delivery rendered difficult by fœtal monstrosity. G. Marchal.

1925, No. 1.

Intra-uterine hæmorrhage from the fœtal intestine. Ch. Dévé.

Some hæmorrhagic manifestations in the neonate and the anti-hæmorrhagic serum of Dr. H. Dufour. Ch. Dévé.

New model of leg holders (for operating table). M. Metzger.

Concerning genital prolapse; true rectocele is very rare. H. Hartmann.

Purulent salpingitis and pregnancy. Auvray.

The antisyphilitic dispensary at the Maternity Department of the Boucicaut Hospital. Le Lorier and Galliot.

New model of forceps. Faustino and Trongé.

SOC. D'OBST. ET DE GYN. DE BORDEAUX.

A case of late death after Cæsarean section (16th day). Jean Petit.

Hæmaturia in pregnancy caused by B. coli. Dax and Favreau.

On a case of hydrocephalus. J. Péry.

Obstetrical shock probably caused by round worms. Forget-Urion.

Staphylococcal infection of the breast without clinical signs. Forget-Urion.

Mastitis in a nursling. Forget-Urion.

Twin pregnancy with one fœtus in front of the other. Favreau.

Intra-uterine injection of normal saline to replace liquor amnii. Favreau.

Annali di Ostetricia e Ginecologia.

March, 1925.

*On the biological and functional value of the so-called interstitial gland of the ovary. G. Dellepiane.

*Extraction of the head, in foot presentation, in the living fœtus, with a flat hook introduced into the mouth. R. Costa.

*Piedmontese Society of Obstetrics and Gynæcology

April, 1925.

*Spasmophilia and pregnancy. D. C. Merletti.

*On tobacco intoxication in pregnancy. L. Rio.

Ankylostomiasis in pregnancy. F. Vozza.

*Transparietoabdominal tubal sterilization. L. A. Oliva.

A case of partial symphysiectomy by Costa's method. T. Soli.

*On a case of acute total inversion of the uterus of obstetrical origin. B. Quarella.

June, 1925.

*Ovarian sarcomata. M. Massazza.

*The total mass of blood in pregnant women at term. A. Pistuddi.

*An uncommon case of fibromyomata of the uterus and pregnancy. F. Maccabruni.

On the biological and functional value of the so-called interstitial gland of the ovary. While in batrachians the interstitial gland forms a separate organ (corpus adiposum), and in kangaroo and mole it is clearly separated from the ovigenous zone, in higher animals it is less and less abundant until, as in woman, it no longer forms a true compact tissue, but the elements of the internal theca of the atresic follicles assuming an epithelioid transformation, and augmented in number, partly undergo hyaline degeneration, partly are transformed into adult connective tissue. The interstitial glandular substance is, in fact, formed from the cells of membrana granulosa filling the follicle with a network of cords which are finally replaced by the enlarged cells of the internal theca.

Various observers have found that with complete atresia of follicles and interstitial substance tubes, uterus, vagina and clitoris in rabbits became atrophied.

The views of different authors on the hormonic value of the interstitial substance have been very divergent.

The author, by different doses of X-rays, sought to ascertain in rabbits :

(1) Modifications in ovary.

(2) Modifications of genital system of animals X-rayed following modifications produced in the follicles and interstitial substance.

(3) If hypertrophy of interstitial substance can be obtained, in complete absence of germinative elements, by hormonic materials.

In complete absence of follicles the interstitial substance rapidly degenerates or is transformed into connective tissue.

He infers that an internal secretion of the ovary can only reside in the germinative portion. The interstitial substances, in the absence of follicles, cannot hinder genital atrophy. There is no definite difference between the ovary deprived of its follicles by X-rays and the ovary removed surgically.

Extraction of the head, in foot presentation, in the living fœtus, with a flat hook introduced into the mouth. The author contrasts the action of the hook (covered with indiarubber) with fingers in the mouth, and contends that the fingers only reaching just within the mouth merely act on the horizontal ramus and make the mouth gape, while the hook pressed far back acts on the ascending ramus through the soft tissues in floor of mouth and causes flexion of the head.

Piedmontese Society of Obstetrics and Gynæcology. Costa advocates lumbar puncture on the living fœtus during podalic extraction whenever the soft parts or the osseous canal have insufficient amplitude. A greater reduction of biparietal diameter is obtained, less danger of lesion of tentorium cerebelli, less compression of centres of respiration and of heart beat, and an easier re-animation from fœtal asphyxia.

Forzano treats cysto-pyelitis in pregnancy with endovenous injections of urotropine. Costa supports him, but Vicarelli would restrict the treatment to the graver cases rebellious to the usual treatment.

Spasmophilia and pregnancy. The author demonstrates the analogies and identities which—regarding etiology, symptomatology, pathogenesis, and therapeutic treatment—exist between certain morbid conditions of pregnancy and that syndrome which in pediatrics is known as " spasmophilia."

The spastic and convulsive manifestations of pregnancy only occur where spasmophilia is present, and the nervous, mechanical, and chemical (toxæmic) stimuli induced by pregnancy are exponents of this individual spasmophilic condition.

Prophylaxis and therapy of spasmophilic conditions call for alimentary therapy, administration of calcium bromide, parathyroid (spasmolysin), ultra-violet rays and hypotensive means.

On tobacco intoxication in pregnancy. The author, experimenting on guinea-pigs, found that only large doses introduced to the gastro-intestinal tract caused sterility or the death of the fœtus, and this from a general organic and functional degeneration of the principal organs, with probably a passage of toxic products from the altered maternal organs. Nicotine did not pass in demonstrable quantity in fœtal organs nor into amniotic fluid.

Transparietoabdominal tubal sterilization. The author advocates this method where the tubes are easily accessible. In the obese, or in cases where Bassini's operation for inguinal hernia has been done, the method is inapplicable. He incises the abdominal walls for some centimetres above the pubes and guiding the right index finger along the round ligament to the uterus reaches the tubes, which are drawn out, and the ampullary portion is fixed to aponeurosis by two points of catgut.

A case of acute total inversion of the uterus of obstetrical origin. Two varieties of uterine inversion : puerperal and gynæcological. In both the uterus is hypertrophied and dilated, and in both a portion of its surface is softened and inert (site of placenta or of tumour). Puerperal inversion may be slow and progressive, only becoming apparent some days after parturition, or acute, tending to death from hæmorrhage.

The case in point had been caused by traction on the cord, and was first

seen by author on the fourth day. Under spinal anæsthesia, the posterior fornix was incised 15 cm. and the pouch of Douglas to same extent, giving exit to some c.c.'s of a serous liquid with small fibrinous flakes. Under guidance of the right index finger introduced through the aperture in pouch of Douglas to bottom of inversion he incised with a curved probe-pointed herniotome the neck and body of the uterus, the latter for two-thirds of its height. With thumbs pressing on anterior wall of uterus he was able with last four fingers of each hand to re-invert the uterus.

Ovarian sarcomata. In forming a classification of ovarian sarcomata the histogenesis of these tissues must be considered, inasmuch as they are foreign to the normal structure of the ovary, and represent therefore heterotropous formations. The connective tissue nature of the lutein cells would seem to be established, anatomical researches having shown the derivation of the corpus luteum from the epithelial cells of the membrana granulosa. There are also vascular tumours, and heteroplastic tumours.

The classification of ovarian connective tissue tumours is :—

Tumours of the common elements of the stroma :
  Typical fibromata.
  Atypical, sarcomata : fusiform-celled ; round-celled (with large and small cells).
Tumours of the elements of the stroma particularly differentiated :
  Sarcomata of lutein cells.
  Sarcomata of interstitial cells.
Vascular tumours :
  Hæmangioendotheliomata—lymphangioendotheliomata.
Heteroplastic tumours :
  Myxoma—chondroma-osteoma, typical and atypical.
  Melanosarcoma—associated neoplastic formations.

The cases in this paper refer to atypical tumours derived from common elements of the stroma, *i.e.*, to sarcomata fusiform- and round-celled.

Fusiform-celled sarcomata.

These originate from the " common " connective tissue and from the elements which have the chief function of providing the elaboration of a fundamental fibrous substance which constitutes the stroma of every parenchyma. This derivation may be demonstrated from the morphological characters of the elements, which are those of typical fibroblasts, and from the fact that in some forms of fusiform-celled sarcomata is preserved the specific functional activity of the fibroblasts themselves, which consists in the elaboration of a fundamental fibrillary substance. In every tumour we can recognize a deviation from type in the arrangement of the elements and in the architecture of the tissue, and a deviation from type in the cells.

The peculiarities which are characteristic of ovarian connective tissue tumours with fusiform cells render it difficult to fix clear limits between ovarian fibroma and sarcoma with fusiform cells. Some forms of ovarian fibroma are notable for the great and unusual abundance of cellular elements. This happened especially in polar fibromas. By these forms we can indicate an intermediate stage between typical fibroma and fusiform-celled sarcoma. This intermediate stage is the equivalent of that variety of fusiform-celled sarcoma known as fibrosarcomas, of restricted development and having a slow and benign course.

Round-celled Sarcomata.

The ovarian sarcomata with small round cells may be regarded as analogous in every way to sarcomata of the same type which develop in other organs. It is very rare. In the case described the tumour showed no residuum of visible ovarian tissue. In places kariolysis and kariorrhexis could be seen in the nuclear detritus. Although the case was highly malignant the symptoms were slight. As regards sarcomata with large round cells the form is only apparently epithelioid, and that only in some tumours where the tissue is more compact and the cellular elements being closely pressed together become polygonal. Moreover, the disposition of the very fine net-work of the stroma, with a single cell in each cavity, distinguishes the growths in question as sarcoma and not epithelioma. Fats and lipoids were always absent.

He concludes that the proper cells of these tumours are not cells with special characters but are undifferentiated elements derived from the common cells of the connective tissue. The solid ovarian tumour more frequent at the youngest age is the sarcoma with large cells. Four of the patients were not over 20. Ovarian sarcomas do not tend to spread by metastasis and although they may be very large they do not give rise to diffusion in their neighbourhood, so that radical treatment is possible. The ascites found is due to the compactness of the tissue of the tumour forming an obstacle to the circulation, hence transudation of plasma from capillaries of tumour and from vessels of the pedicle. Amount of fluid small, blood-stained and turbid, unlike cases of ovarian fibroma.

In only one case was the opposite ovary removed and histological examination showed that, although it was sensibly larger than normal, there was merely a microscopical degeneration quite unlike the neoplasm developed in the ovary of the other side. In none of the five cases of sarcoma with large cells in which the ovary, normal in appearance, was left, has there been a reproduction of the tumour in that ovary. The observations date from 1921. In cases where complete removal of the tumour was not possible deep Roentgen-therapy was most successful.

The total mass of the blood in gravid women at term. *Experimental researches with Congo Red.* Congo Red is innocuous and is not absorbed by the corpuscles. Mass of the blood in gravid women varies from a minimum of 6.04 per cent. to a maximum of 9.84 per cent., while in normal non-gravid women it varies from 5.23 per cent. to 7.8 per cent. of body-weight. The increased mass of blood is not proportional to the increased weight of the gravid woman, but is less than that. It serves, however, for her own needs and those of the fœtus; and, not improbably, accounts for the absence of disturbance from loss of blood of the secundines. In gravid women at term there is a tendency to values below normal for protein substances and red corpuscles. In the puerperium the values tend to be raised, and more sensibly for the protein substances than for the red corpuscles.

Conclusions.

1. The Congo-red method of von Griesback is the best for clinical research.

2. The total mass of the blood is notably increased in gravid women at term compared with the puerperium and with normal women.

3. The increase affects all the components of the blood with a tendency, however, to an increase of the watery contents and a relative diminution of

the proteins and of the red corpuscles, which, however, are absolutely increased.

4. The increase of the total mass of the blood very probably is related to the greater capacity and development of the vascular system, with the increased need of oxygen, with the special characteristics of the metabolism of the gravid woman and may represent a reserve for the hæmorrhage of the secundines.

An uncommon case of fibromyomata of the uterus and pregnancy. The case was one of pregnancy at term in a uterus the seat of enormous fibroids for the most part developed beneath the ligament, the fœtus with shoulder presentation, infection of the uterus and its contents, albuminuria. Total hysterectomy was done, followed by cure. From the vulvar orifice protruded a long loop of umbilical cord black with gangrene. Very fœtid ichorous fluid was discharging. The uterus was enlarged as in a twin pregnancy at term. There was an especially large node developed partly beneath the right ligament and enveloping the large and stretched round ligament. Another large node was developed beneath the left ligament. The uterine cavity was little deformed by the presence of the fibroids. The patient, of low intelligence had not noticed any sign of the fibroids which must have existed before pregnancy. She had not noticed any symptom of compression from the enormous mass of the uterus; even after rupture of the membranes with the umbilical cord hanging between her thighs, she had quietly gone about her domestic duties. The tumours, of which there were thousands, had softened with the progress of pregnancy and had become flattened. A sufficient space of the muscular wall towards the interior allowed the normal development of the placenta. Pregnancy had continued for a month after rupture of the membranes and the exit of the amniotic fluid.

Total hysterectomy was indicated by: (1) The very probable existence of fibroids of the uterus; (2) the impossibility of extracting the fœtus; (3) a grave infective process, which was still limited to the uterus and its contents. J. R. FORREST.

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Walter Wegelius. S. E. Wichmann.

*The relations between the state of pregnancy and tuberculosis. H. Forssner.

*A case of chronic torsion of the uterus. K. Olsson.

*The fixation of the fœtal head during the latter part of pregnancy. A comparison between primiparæ and multiparæ. P. Wetterdal.

*Bleeding caused by small pieces of placenta retained in the uterus. L. S. Petersen.

*A case of leukæmia and pregnancy. I. Ohlsson.

*A case of hydatidiform mole of the ovary. P. Moller. and A. Als-Nielsen.

SUPPLEMENT.

*The genesis of tumours of the urethro-vaginal septum. E. Biorklund.

The relations between the state of pregnancy and tuberculosis. Forssner combats the opinion of many writers, especially Germans that preg-

nancy has a very unfavourable influence on tuberculosis. He thinks that too little allowance has been made for the fact that tuberculosis is a malady which tends to become aggravated with or without pregnancy.

The present investigation has been carried out since 1917. All the women delivered in the Stockholm Maternity Hospitals were systematically examined for pulmonary tuberculosis, and those affected were referred to the Tuberculosis Dispensaries. In this way the after-history was obtained for a period of one or two years in about 300 cases, and the results were compared with those found in a similar number of women who had not been pregnant. In cases of early disease, the progress was exactly the same in the two groups; in more advanced cases, the figures show a slight advantage for the non-pregnant, but the difference is not greater than might be the result of chance.

Another argument used by writers who advocate the induction of abortion is that the child of a tuberculous woman has a poor chance of survival. Forssner's statistics show a very heavy incidence of tuberculosis in the children remaining with their mothers—40 out of 89; but the children taken away from their mothers seem to run no undue risk—two cases of tuberculosis amongst 34 children.

He concludes that there should be no question of the induction of abortion, except in rare cases in which there is some special indication.

A case of chronic torsion of the uterus. This condition was first described by Virchow in 1863, and since then about 60 cases have been recorded. In 30 the uterus was enlarged by the presence of myomata. In most of the others, an ovarian tumour was present. In four, pregnancy was associated with uterine or ovarian tumours; and in two cases torsion of the uterus occurred during pregnancy unassociated with tumour. The ovaries may retain their normal position, or they may follow the uterus.

Olsson's patient was a nullipara 63 years old. The symptoms extended back 20 years to a sudden onset when she was lifting her sick father. There had been acute illness for 12 days before the operation. A myomatous uterus was found to have undergone torsion through 540° (one and a half complete turns) between the body and the cervix. The body of the uterus and the appendages, which accompanied it in its twist, were blue-black in colour. Supravaginal hysterectomy was done, and the patient recovered.

The fixation of the fœtal head during the latter part of pregnancy. A comparison between primiparæ and multiparæ. This point was specially investigated in 250 cases of each group. Only vertex presentations, with normal external pelvic measurements and fully developed fœtus were included: cases of hydramnios, twins and placenta prævia were excluded.

If the head is mobile in the case of a primipara, during the last month of pregnancy, attention should be directed to some of the factors which hinder fixation. This mobility, however, does not denote that a pathological condition of necessity exists—an opinion which was formerly general. The present results show that the head was movable in 47 per cent. of all normal cases. During this time there is no great difference between primiparæ and multiparæ as regards the percentage of fixed heads.

When labour begins, the head becomes fixed much oftener in primiparæ than in multiparæ. This seems to be caused by the different condition of

the lower uterine segment in the two classes. The tonicity of the abdominal wall, and the quantity of liquor amnii, do not seem to play any part in the fixation of the head except in extreme cases.

Bleeding caused by small pieces of placenta retained in the uterus. Brandt has prominently stated that the so-called atonic post-partum hæmorrhage is often due, not to atony of the uterus, but to something left behind, especially a piece of placenta. This opinion has been opposed, because in cases where it is known that membranes remain, excessive bleeding does not occur. All agree that fragments of placenta, small as well as large, can cause persistent bleeding, after birth as well as after abortion, and that the amount of bleeding is nowise proportional to the size of the fragment. Such long continued bleeding ceases immediately the retained body is removed.

A satisfactory explanation of these clinical observations has not been given. It is often said that the fragment causes atony of the uterus; but, considering that a whole placenta excites uterine contractions, it is difficult to understand why a small piece should cause atony. Few observations of the morbid anatomy are available, but they seem to show that the bleeding comes from a small part of the wall of the uterus and not from the whole cavity. This supplies a clue to the solution of the problem.

The placenta, from the maternal point of view, may be compared with a cavernous angeioma. In operating on such a tumour it is easy to control the bleeding if the entire tumour is removed, for only a few isolated vessels have to be dealt with; but if part of the tumour remains there is persistent oozing which can be checked only by firm pressure. It is the same with the placenta. If it is completely separated, the vessels retract into the wall of the uterus and are compressed by the muscle fibres; but if a fragment is left, the cavernous sinuses may remain open and may continue to bleed. Not all portions of retained placenta cause hæmorrhage, because the sinuses are not always opened, and again, the uterine contractions may apply sufficient pressure to keep it under control.

Acceptance of this explanation will lead to modification of treatment in the direction of more frequent exploration of the interior of the uterus. Retained fragments are easily found, because the clot in the uterine cavity is attached more firmly at the one point and loosely elsewhere. On account of the risk of infection, exploration should be done only when necessary, *i.e.*, when the bleeding does not stop after other measures have been applied. The risk of continued loss of blood is greater than the risk of infection.

A case of leukæmia and pregnancy. Ohlsson gives a summary of 12 cases collected from the literature and describes another case of his own. In five cases pregnancy had occurred in patients known to be leukæmic; in the remaining eight the leukæmia has manifested itself during pregnancy.

A pregnant woman, who develops an acute leukæmia, generally goes downhill rapidly; but this depends on the nature of the disease. In chronic leukæmia, pregnancy and parturition may be normal; but as a rule a deterioration results, the most dangerous time being the puerperium.

Leukæmia has a harmful effect on pregnancy. In four cases abortion occurred. It is clear that these patients will suffer unduly from abdominal distension, since the available space is already largely taken up with the

spleen and liver. Interruption of pregnancy has in several cases caused a decided improvement.

The disease is never conveyed to the fœtus. Sections of the placenta show normal blood in the chorionic villi and leukæmic blood in the intervillous spaces.

A case of hydatidiform mole of the ovary. A nullipara, 35 years of age, after amenorrhœa for two months, was seized with colicky pain in the right side of the abdomen, accompanied by slight vaginal hæmorrhage. Examination showed, behind and to the right of the uterus, a soft mass the size of a fist.

At the operation the mass was found to be the right ovary. The tube was quite normal. The interior of the ovary was occupied by a quantity of blood-clot with numerous vesicles, the histological features of which corresponded precisely with those of hydatidiform vesicles. The wall of the ovary contained a good deal of lutein tissue.

Although no fœtus could be recognized, the authors have no doubt that the condition was the result of a pregnancy. A few cases of tubal hydatidiform mole have been described, but this is the first hydatidiform mole of the ovary. Some authors have described vesicles occurring in teratoid tumours of the ovary, testicle, etc., but the resemblance has only been superficial.

The genesis of tumours of the urethro-vaginal septum. This monograph includes a bibliography of almost everything which has been written concerning the development of these parts, and concerning tumours and cysts of the vagina. It appears that Galen was acquainted with the Wolffian ducts, and Skene's glands had been described more than a century earlier by Haller.

In the urethro-vaginal septum are found a number of glands which are homologous with the male prostate. The upper ones open into the posterior wall of the urethra; the lower drain through the two ducts of Skene.

Both solid tumours and cysts of the urethro-vaginal septum usually develop in the region which corresponds to the "female prostate." Gärtners' ducts are extremely rarely found in this position, and the genesis of the tumours and cysts is to be ascribed to the female representative of the prostate. Careful examination of future cases should confirm this view of their causation.

A. GOUGH.

Zentralblatt für Gynäkologie.

December 6, 1924.

*Extirpation of the uterus or supravaginal amputation for myomata? J. Halban.

*Multiple dermoids of the ovary. G. Kaboth.

Is Rissmann's compressor free from danger? H. Schultheiss.

The early diagnosis and treatment of diffuse peritonitis. K. Sommen.

A case of almost complete loss of sensation for pains. R. Kuepel.

*Echinococcus of the Fallopian tube. H. Thomson.

The diagnosis and treatment of extra-uterine pregnancy in the last ten years. St. Sztehlo.

Formation of vagina from rectum for unusual conditions. H. Kakuschkin.
The action of calcophysin, especially for hæmorrhage of inflammatory origin. B. Lorenz.

December 13, 1924.

*Therapy of bacterial infection and operative mortality. E. Holzbach.
The Baden eclampsia statistics, 1910—1922. W. Gessner.
Indications for formalin treatment of the endometrium according to Menge. H. Runge.
*The cause of the non-coagulability of menstrual blood. O. Fellner.
Symptomatic and therapeutic considerations on tubal insufflation. F. Kirstein.
On tubal insufflation. E. Pribram.
*Icterus neonatorum and Widal's reaction. G. Marondis.
Kryptogenic infective foci in the organism and their medico-legal importance in obstetrics and gynæcology. M. Kaslin.

December 20, 1924.

Increase of tubal pregnancy during the last two years and its probable causes. M. Graefe.
The technique of blood transfusion. G. v. Wolff.
Experiences of clearing out the uterus immediately *post partum* to prevent retention of placental rests. O. Wiemann.
Investigations into the possibility of forcing air into the venous system in pertubation. G. Schallehm.
How is the danger of air embolism during tubal insufflation to be avoided? H. Sellheim.
Exaggeration of the danger of air embolism in tubal insufflation. K. Volkmann.
The origin of wounds during coitus. K. Seynsche.
*A sewing needle in the ovary found at operation. F. Bierende.
Periosteal pain and its constitutional and diagnostic importance. J. S. Galant.
*Supravaginal amputation or total extirpation for uterine myomata? H. Thomson.

December 27, 1924.

*Intramural pregnancy. H. Perli.

January 3, 1925.

*Bacteriological prognosis and diagnosis. G. Winter.
*Against rectal examination in obstetrics. F. Ahlfeld.
*Indications for vaginal examination during labour. R. Schröder.
*The treatment of sepsis. E. Philipp.
Anterior and posterior occipital presentations. H. Martins.
The diagnosis, prophylaxis and therapy of congenital syphilis. E. Klaften.
*Escape of blood from the Fallopian tube during menstruation. C. G. N. Noë.
Erythema exudativum multiformæ of the vaginal mucosa and the portio vaginalis. J. Holzschuh.
An unusual malformation of the portio causing obstruction in labour. W. Hoeck.
Recessus parauterinus. E. Herrmann.

January 10, 1925.

The ætiology and diagnosis of spontaneous rupture of the gravid uterus. O. Hoehne.

Lipoid metabolism and ovary. R. Meyer.
The importance of ovarian lipoids. Th. Wiczynski.
The treatment of gonorrhœal Bartholinitis. H. Hübner.
Fraenkel's gas bacillus in genital sepsis. E. Noltmann.
Two fatal cases of tubal bleeding. K. Heine.
On parametritis posterior spastica. W. Rubeska.
Clinical experiences with argochrome, trypaflavan, argoflavin, and rivanol in the treatment of septic puerperal conditions. B. Heptner.

January 17, 1925.

The technique of digital clearing out. H. Füth.
*A case of primary abdominal pregnancy. J. Meyer.
Anatomical researches on the rectus abdominis muscle in its normal condition, during pregnancy and in the puerperium. H. Küstner.
Observations on the dangers and mistaken diagnosis in tubal insufflation. G. Frommolt.
Clinical experiences of tubal insufflation. E. Vogt.
*Excessive uterine decidual hyperplasia in tubal pregnancy. M. Speiser.
*Simultaneous bilateral tubal pregnancy. M. Bordjoschki.
*A certain early diagnostic sign of extra-uterine pregnancy. Z. Bánki.
On hydrops universalis fœtus et placentæ. W. Hoeck.
Union of the skin in fresh rupture of the perineum with Herff's clamps. H. Schmid.

January 24, 1925.

Obituary notice and bibliography of Ernst Bumm.
General symptoms in retro-versio-flexio uteri. R. Th. v. Jaschke.
Split pelvis without malformation of the abdominal wall or bladder. C. Meyer.
Ileus after ventral suspension of the uterus. P. Fjeldborg.
Labour with an almost completely occluded vagina. L. Kluger.
Rises of temperature from the lactating breast. K. Hensler.
The action of Sellheim's lever on the head in deep Intraperitoneal uterine sections. E. Vogt.
Post-operative dehiscence of fresh laparotomy wounds with prolapse of the abdominal contents. C. Holtermann.
Novoprotein in the treatment of inflammatory diseases of the adnexa. H. Hellendall.
Malignant neoplasms in the cervical stump after supravaginal amputation of the uterus. C. Fleischmann.

January 31, 1925.

Sinus thrombosis in the puerperium simulating eclampsia. W. Zangemeister.
Ætiology of sterility. A. Greil.
Arterial stripping ("periarterial sympathectomy") in gynæcology. H. H. Schmid.
Previous radiation of carcinoma of the cervix and its influence on post-operative infection of endogenous origin. W. Fürst.
Contribution to the chapter: Restoration of the possibility of conception. P. Gellert.
Operation under intravenous ether narcosis for severe hæmorrhage in ruptured tubal pregnancy. E. Eick.
On extra-peritoneal vaginal minor Cæsarean section. D. v. Ott.

Dysmenorrhœa and its treatment. R. Mandelbaum.
The treatment of placenta prævia. G. Conrad.

Extirpation of the uterus, or supravaginal amputation for myomata? Halban discusses various views, recently prevalent in Vienna, regarding the best method of operation for myomata. He gives statistics of his own operations for the past twelve years, pointing out that the percentage mortality cannot be regarded as an absolute indication for the choice of operation, because his rule was to employ supravaginal amputation or vaginal total extirpation in all cases which were uncomplicated or had few complications. In all cases where there was suspicion of peritoneal sepsis or extensive growth, he resorted to abdominal total extirpation. His statistics are :—Supra-vaginal amputation : 134 cases, 2 deaths—1.5 per cent; abdominal total extirpation : 35 cases, 2 deaths—5.7 per cent. mortality; vaginal total extirpation : 254 cases, 0 deaths. He considers that unless the patient's condition is very serious, vaginal extirpation is the method of choice for all small tumours. It is easily carried out, operation shock is slight, and the whole duration of the operation is in many cases not more than 15 minutes.

He found that an exudate was formed more frequently in uncomplicated cases, treated by supra-vaginal amputation than in the severer cases treated by vaginal or abdominal total extirpation. He also found that in abdominal total extirpation, clean cases took a relatively longer time to heal than septic cases. He draws attention to these facts to emphasize the necessity of a cautious interpretation of the results of his statistics.

Multiple dermoids of the ovary. The study of multiple ovarian dermoids is of the greatest importance in deciding the histogenesis of the dermoid cyst, whether it is blastomeric or ovulogenic in origin. Kaboth considers the first hypothesis as one that is deservedly coming to the front. He thinks that if the dermoid originated from the ovule or corpus luteum, there would be traces of membrane. Observations of small cysts or protuberances have never proved the existence of these.

The author describes a case of multiple ovarian dermoids (13 in connexion with the left and three with the right ovary). In spite of the size of the tumour, which reached from behind the uterus to the umbilicus, the patient had had no pain, but from the age of 12, when menstruation began, till the present (age 24), she always had irregular and profuse periods.

On opening the peritoneum a double tumour was seen, the left twisted on its pedicle and adherent to omentum peritoneum and intestine. In both tumours the cysts and their outgrowths showed typical dermoid contents : fine hairs, skin, bones, and, in one, two teeth. The walls of the cysts, large or small, showed no trace of ovule membranes or remains of these. The origin of the cyst from the ovule of the ovary is, therefore, improbable. It is more likely that the origin of so many similar cysts is due to the implantation of a blastomal complex in the ovary.

Echinococcus of the Fallopian tube. Usually primary echinococcus of the pelvis develops in pelvic connective tissue, and is rarely found in the inner genital organs. Thomson describes a case of tubal echinococcus, without metastasis, operated on by him in 1904. The patient, aged 35 years, had noticed for 15 years a slowly growing swelling in the abdomen. She also suffered from increasing pain, and, on this account, agreed to operation.

On opening the tumour it was found to be composed of a multitude of echinococcus cysts. One sac was the size of a child's head, the other the size of a closed fist. Both communicated and lay behind the uterus, to which they were attached by a short pedicle. The thick sac walls showed on miscroscopic examination similar structure to the walls of the tube, sometimes with degenerated patches, small-cell infiltration and complete loss of mucous membrane. The ovaries and the right tube showed only inflammatory changes. It was, therefore, a case of primary echinococcus of the tube. The author believes this to be the third case recorded, the others being described by Doleris and by Eden.

Therapy of bacterial infection and operative mortality. For many years the author has made bacteriologic examination to determine the amount of germs contained in the operation field, during various operations. He found that in laparotomies, of long duration, only 63 per cent. remained free from germ infection, the remaining 37 were auto-infected. In the infected cases 75 per cent. were staphylococcic and 25 per cent. streptococcic. He found that the streptococcal infected cases gave a mortality of 23.5 per cent. as against a mortality of 3.4 per cent. with staphylococcal, and 0 per cent. in all other infections. Fifty-three per cent. of the streptococcic findings occurred after Freund-Wertheim's operation for columnar carcinoma.

By following a treatment similar to that of v. Jaschke in septic midwifery cases he had obtained remarkably good results, the mortality from peritonitis in 181 cases being only .55 per cent. The treatment consisted in giving a prophylactic intravenous injection, once or twice, of 10-20 cms. of argochrome, before an operation, in all cases which might end fatally, such as carcinoma operations (Freund-Wertheim) and adnexial tumours with high temperature. He also found that the introduction of camphorated oil or rivanol into the abdominal cavity before or during operation was efficacious. Neither argochrome nor camphorated oil can be regarded as specific against certain bacteria, but both appear to increase the resistance of the tissues to bacterial toxins.

The cause of the non-coagulability of menstrual blood. Fellner discusses views held as to the cause of the want of coagulation shown by menstrual blood, a property which is possessed only by blood coming from the uterus. Blood taken from the vagina by puncture does not differ in coagulability from ordinary blood. Some consider that the alkalinity of the uterine mucosa has the effect of rendering the blood fluid, and this may be due to a ferment secreted by the mucosa. The study of the hormones of the placenta and the ovary led to another hypothesis. Fellner describes experiments made on guinea-pigs whereby 5 cc. of blood, obtained from a placenta or from corpora lutea, mixed with other blood, made it uncoagulable for several days. With human placental blood mixed with water, and then with other blood, he found the same result. Experiments with menstrual blood gave the same result. Fellner's opinion is that a hormone produced in the corpus luteum is separated in the uterus, mixes with the blood from the uterine vessels and renders it uncoagulable. He considers that the whole behaviour of the substance he isolated, *e.g.*, its solubility in alcohol and its resistance to increased temperature, is against the view held by some that it is a ferment.

Icterus neonatorum and Widal's reaction. Marondis publishes methods and tabulated results of an examination of 20 cases of icterus neonatorum. The conclusions he draws from these results are :—

(*a*) The number of leucocytes, as is known, is increased in newly-born infants.

(*b*) In 15-20 cases hæmoclastic crises were present.

(*c*) That in these 15-20 cases, in which hæmoclastic crises occurred, only three cases sickened with icterus neonatorum, *i.e.*, only 20 per cent. of all his cases.

Therefore his results coincide with those of Heiniss and Heller who found 26 per cent. in their examinations, and are opposed to those of Linzenmeier and Zvamyl who found 90 per cent.

Increase in tubal pregnancy during the last two years, and its probable causes. The author relates that, struck by the remarkable increase of tubal pregnancies in his Station during the year 1923 (5 per cent.) over the year 1922 (2.7 per cent.), he looked up his statistics since 1911, and was surprised to find that from the years 1915—1921 the average number of tubal pregnancies was 1.25 per cent., the numbers in 1913 and 1914 being 5 per cent. to 6 per cent. Just after the war there was a marked increase in cases of gonorrhœa in both sexes. This would lead to temporary, if not permanent, sterility in the female, with the consequence that the number of all pregnancies, tubal included, decreased. There was also a great increase in cases of criminal abortion. He points out that two factors determine the passage of the ovum through the tube (*a*) peristalsis of the tube musculature and (*b*) ciliary movement of the epithelium.

During the first years after the war the number of tubal diseases caused by gonorrhœa or criminal abortion would cause sterility. Later, however, partial regeneration of the ciliary margin of the epithelium, perhaps also renewed peristalsis of the tubal muscles at the distal end of the tube occurred, even though the uterine end showed, as he had himself observed, absence of ciliary hairs, small-cell infiltration of the mucosa and club-shaped thickening of the mucous folds. Passing through the distal end the ovum comes to rest between the adhesions.

If the author's view be correct he thinks that in future a further increase may be expected in the number of cases.

A sewing-needle in the ovary, found at operation. On account of the rare occurrence of foreign bodies in an ovary, Bierende thinks it of interest to describe the following case :—

The patient, aged 24 years, married, nullipara, complained of abdominal pains. After examination the pain seemed to be explained by a diagnosis of retroflexed fixed uterus with a two months' pregnancy. After some days abortion occurred—finished by curetting—and the patient made a good recovery.

Nine months later she returned complaining of severe abdominal pain on the left side. This had begun after a fall downstairs. Examination per vaginam showed the uterus to be still retroflexed and fixed, and, on the left side, between uterus and left ovary, there was a small, hard extremely sensitive scar. After rest in bed and medical treatment slight improvement occurred, but as pain remained, operation was decided on. Laparotomy was performed, and on feeling the left adnexa a sharp foreign body was

detected in the left ovary, giving rise to the suspicion that a needle had been left in a former operation. There had been no previous operation, and on examining the ovary an ordinary sewing-needle, half-embedded in it, was found and easily withdrawn. The left ovary was freed from adhesions and the uterus ante-flexed. Fourteen days later the patient left perfectly well.

On questioning her she admitted that when 16 years old she had swallowed a needle but had afterwards been given a great quantity of mashed potatoes to eat, and as she had no pain she concluded the needle had passed out. Shortly before her marriage she had occasional stabbing pain, but was free from it for weeks at a time.

It is probable that the swallowed needle had passed through the gastro-intestinal tract to the rectum and, then, for some unknown reason had perforated the bowel, and found its way into the pelvis. It may be conjectured that the patient's fall in January caused the needle to pass to the left and fix itself in the ovary.

Supravaginal amputation or total extirpation for uterine myomata? Thomson states that 10 years ago he published a book, in Russian, advocating supravaginal amputation as the operation of choice for uterine myomata. He considers that the cervix is essential for support of the vagina, that malignant degeneration seldom if ever occurs after operation in the stump unless it was present in the first case before the operation. His experience of operating on many hundred cases since his book was published has only confirmed his views. Thus only two cases of cervical carcinoma following operation for myoma were proved to be due to non-recognition of malignancy at the first operation. In this connexion he thinks it of interest to describe two cases where in the one case evidence of carcinoma, in the other of sarcoma, were detected immediately after a supravaginal amputation. Both patients were kept under observation and in both nearly two years after the cervix stump remained normal.

Intramural pregnancy. Perli quotes from Geblich's "Pathologic Anatomy of the female sex organs": "The development of the ovum in that section of the tube which pierces the muscular wall of the uterus is a relatively rare occurrence." This statement he can confirm by reference to current literature on the subject. It is therefore of interest to give a description in detail of a case on which he operated in 1924. The patient, aged 22, came to consult him because of persistent nausea and vomiting. She had not been pregnant before. Her last period had taken place six weeks before, and the symptoms named had set in since.

On examination the uterus was enlarged and evidently gravid. The patient received prescription and instructions and was dismissed. A week later she returned, as the symptoms were worse and she could not carry on her work because of sleeplessness and heart attacks. Interruption of pregnancy was decided on.

23/iv/24. Dilatation and clearance of uterus. No evidence of a segmented ovum. The mucous membrane particles showed in microscopic examination the stage of decidual reaction. Adnexa examined particularly, while patient was under chloroform, and were found to be free.

27/iv/24. Patient dismissed. Still complained of sickness but vomiting had stopped.

24/v/24. Patient's condition was no better. Examination gave the impression of a distinct two months' pregnancy, and an interstitial pregnancy (the author had operated on a case one month before) was suspected.

27/v/24. Laparotomy, and previous to this dilatation of cervix and curettage of uterus. Cavum uteri empty. Median incision. Cæsarean section. Placenta found immediately. Two months' fœtus with all membranes removed. There remained a cavity distinct from that of the uterus, evidently on the anterior wall of the uterus. Adnexa free.

There was no doubt that the case was one of interstitial pregnancy, and that the ovum had developed on the wall of the uterus. The author had, as already mentioned, operated on an interstitial pregnancy which had ruptured into the abdomen, and his assistant had after that operated on another. By good fortune this third case was unruptured, which made the distinction easier. Schickel's hypothesis is that the ovum becomes embedded in a pre-existing uterine diverticulum. Perli thinks it more probable that it enters a uterine gland, the mouths of which are sufficiently large to admit it. As the gland sinks deep into the muscle, so the ovum presses down into the deeper muscular layers. However, the solution of the problem may be exactly determined by future information.

Bacteriological prognosis and diagnosis. Winter refers to an important and interesting article by Bumm (*Zentralblatt,* No. 37, 1924) in complete accord and support of one published by himself in 1911, advocating bacteriological examination of the vaginal secretion before any vaginal examination.

Bumm found that in 72 cases of operation for uterine cancer, where he had tested streptococcic virulence of the vaginal secretion by means of Phillip's sign, three out of four cases with virulent streptococci died, and out of 68 cases with avirulent streptococci, 67 recovered.

Winter gives his own statistics in similar operations carried out during 24 years (1900—1924). In 101 *abdominal* uterus extirpations 37 with streptococci gave 24 per cent. mortality; 64 without streptococci gave 3 per cent. mortality, and in 276 vaginal uterus extirpations 61 with streptococci gave 18 per cent. mortality; 215 without streptococci gave 1.8 per cent. mortality. These figures give ample proof of the danger of streptococci and of the importance of bacteriological examination to determine (*a*) prognosis and possibly diagnosis of the case, (*b*) advisability of operative interference or not, and (*c*) preliminary antiseptic treatment.

Winter points out that the mere presence of hæmolytic streptococci in the secretion is not enough in itself to decide the prognosis. Regard must be also paid to the quantitative behaviour of the bacteria. Isolated or decreasing colonies count for little, while increasing numbers are very serious. The defensive power of the blood must also be taken into account.

Bumm recommended the extension of virulence testing to cases of puerperal fever and of septic abortion. Winter thinks it should be employed in all vaginal operations. He considers that many an unexpected fatal issue after a simple operation for prolapse might be traced to the presence of virulent streptococci in the vagina. In some cases he has proved this connexion, and in others it is extremely probable that a previous examination would have shown streptococci to be present.

Against rectal examination in obstetrics. The recommendation to examine

by the rectum in obstetrics seems to be extending from institutions to general practice.

Since it is now generally recognized that the infection in cases of puerperal fever comes from without, it is desirable that all unnecessary vaginal examination should be avoided, and that the greatest care should be exercised in sterilizing the hands. According to H. Baum, "Absolute hand disinfection is unattainable," but the author thinks that the far-reaching effect of alcohol disinfection is overlooked, and that a rectal examination can never take the place of a utero-vaginal. For the patient it is unpleasant and also for the obstetrician. It never gives the same certain information as the utero-vaginal. The cardinal point of the whole matter is that an external examination can only be completed by an internal examination, and that rectal examination should be conducted only in a few exceptional cases.

In the year 1922 Ahlfeld published results of examination after alcohol hand disinfection. Out of 8,753 cases, examined frequently for teaching purposes, only one death from puerperal fever was reported. In practice by midwives equally good results were obtained. One midwife gave statistics showing that between 1904-1923, out of 1,497 births, only one death from puerperal fever occurred. He concludes that the hot-water-alcohol method of hand disinfection recommended by him, carried out with scrupulous care and accuracy, does away with any necessity for a rectal examination.

Indications for vaginal examination during labour. Schröder is of opinion that, in most cases of labour, external examination followed by rectal examination is sufficient to give all information requisite for determining the size of the os and the position of the head in the pelvis, and that vaginal examination should be made only in a small number of cases, thus avoiding danger of puerperal sepsis.

He summarizes the indications, where he thinks vaginal examination is necessary :—

(1) When vaginal examination, followed by rectal, has not clearly demonstrated the position of the fœtus, *e.g.*, in transverse presentations, or when there is disproportion between the head and the pelvis.

(2) When, with the head high in the pelvis and the os moderately dilated, the membranes rupture. There is here danger of prolapse of the cord, arm presentation from a narrow pelvis, etc. These conditions can only be ascertained by vaginal examination.

(3) When the birth of the second child of twins does not occur soon after the first. Here also there are risks of prolapse of the cord and abdominal presentations.

(4) When, in spite of good pains in the expulsive period, no progress is being made. Abnormal presentation or deformity of the vagina or cervix might be the cause of delay, and vaginal examination is most necessary.

(5) In cases of abnormal hæmorrhage before birth, where the presence of carcinoma, polypi or varix is suspected. Placenta prævia can usually be determined by external and rectal examinations.

(6) When operative interference is indicated.

The treatment of sepsis. Alluding to the high mortality in puerperal fever (about 90 per cent.), Philipp describes and discusses chemical and sero-

therapy employed, with special reference to intravenous injections of rivanol. He found that a solution of 5 in 300 produced a diminution, lasting some hours, of the bacterial colonies in the blood, but afterwards the original condition again occurred. A higher concentration of the substance was harmful; a lower had no effect. He could not procure a decrease in the number of germs with injections of any other substance. He was led to the conclusion that, given the grave changes which the infection had produced, the only remedy lay in acting directly on the focus of infection with an enormous quantity of germicide. Such an action could best be obtained by inhalation and absorption of a gas through the lungs. Experiments with ether narcosis were unsuccessful, but he had the opportunity of trying a new gas—purified acetylene or narcylene. He describes in detail its effect in nine cases; when the blood was crowded with colonies of streptococci or other germs the patients being extremely ill with septicæmia or pyæmia. The technique of the narcosis was the same in all. Beginning with 80 per cent. narcylene he passed on to 60—50 per cent. Time of narcosis lasted about 40—60 minutes per diem. In all cases the number of colonies diminished remarkably after the first narcosis, and after the second or third the blood became and remained sterile permanently or for many hours. The general condition of the patient was not unfavourably influenced by the gas. Many patients seemed relieved by it, but all were so ill that eight out of the nine died. To solve the question as to the cause of the germ diminution, experiments were made with culture of streptococci in bouillon and in blood, the gas being streamed over the fluid. No diminution in the number of colonies was obtained.

Philipp thinks that the effect of inhaling the gas may be to alter the hydrogen-ion concentration of the blood, so that nutriment is denied to the germ colonies. His experiments show that it is possible through breathing an acetylene-oxygen mixture to purify the blood for a long period of time. Perhaps through a longer narcosis or discovery of some other gas, a better effect may be obtained.

Escape of blood from the Fallopian tube during menstruation. Schmid discusses varying views on the origin of ovarian cysts, whose walls show islets of epithelial growth resembling the uterine mucosa. He is in favour of Sampson's view published in 1922 that the origin of such growths is the passage backward during menstruation of cells from the uterine mucosa. There menstrual blood containing these cells finds its way through the tubes into the peritoneal cavity, and there the cells settle, primarily, or secondarily, in the pouch of Douglas or on an ovary, leading to cystic growths. Sampson recorded cases in which he had seen menstrual blood flowing from the tubes, when an operation was performed during menstruation, or when curettage of the uterus had immediately preceded laparotomy. Sampson and others attributed this backward flow to pathological conditions of the uterus, *e.g.*, simple or malignant growths or retroflexions.

Schmid thinks it may be of interest and bring further support to Sampson's theory to record a case on which he operated in 1911 where backward flow was demonstrated with normal tubes and a hypoplastic uterus.

The patient, aged 18, was admitted to hospital because of menorrhagia which had lasted four days after the normal period. Previously menstrua-

tion had been perfectly regular. The uterus was smaller than normal, the adnexa were free and somewhat tender to pressure. Two days later hæmorrhage became profuse, and on the left of the uterus could be felt a soft tumour about the size of a walnut. As the patient also showed all the symptoms of internal hæmorrhage, diagnosis of ruptured tubal pregnancy (left) was made and laparotomy performed. Traces of blood were found in the pelvis, due to a small quantity of blood trickling from the right tube and a small blood-clot was removed from the right ampulla. Otherwise the right tube showed no pathological change; the left tube and the uterus were free. The tumour to the left of the uterus was found to be scybala in the sigmoid flexure. The mistake in diagnosis arose from disregarding the facts that there were no changes in the breasts or uterus which would have accompanied an extra-uterine gestation. Neither was there a hæmatocele, which, after six days' bleeding, would have followed a tubal abortion. The blood showed no traces of chorionic villi. As the blood came from the tube the probability was that it was menstrual blood flowing back into the pouch of Douglas. It was possible that bi-manual examination of a muscularly weak uterus had favoured this flow. Had the patient not been operated on it is possible that later she might have developed a sero-adenomyoma in the pouch of Douglas, or on the right ovary, for with the menstrual blood particles of uterine mucosa with epithelium and stroma capable of starting new growth might have been carried.

A case of primary abdominal pregnancy. Meyer describes a case of abdominal pregnancy, on which he operated in August, 1923, and which he thinks undoubtedly fulfilled Veit's three tests for *primary* abdominal pregnancy. The three conditions were (1) The ovum should have no connexion with the tubes or ovaries; (2) The ovum must have lived; (3) It should be in living connexion with its matrix.

The patient, aged 25 years, was admitted with a diagnosis of ruptured tubal pregnancy. She was married four months before admission. Her last period had occurred on 1st July. In August she had suffered from vaginal pain and a feeling of pressure in the abdomen along with a slight non-hæmorrhagic vaginal discharge. She visited a physician who made an internal examination. Immediately after the visit the pain became much worse, and grew still worse during the night. There was no hæmorrhage, sickness, or rise of temperature. Next morning she was sent to hospital. Examination detected bulging and resistance of the posterior fornix. The os was closed. Laparotomy was performed. In the pelvis there was much blood and blood-clot. The uterus was enlarged and pushed forwards. On its front wall was a very small myoma. The tubes and ovaries were normal. On the posterior wall of the cervix projecting into and nearly filling the pouch of Douglas the ovum was found. The sac was ruptured (1.8 cm.) towards the free pelvis, and the fœtus (3.5 cm.) attached to the umbilical cord (3.2 cc.) was hanging into the pelvis. The placenta was partially loosened from its insertion and the ovum nearly free, so that on the posterior wall of the cervix there was a rough uneven surface bleeding profusely. The tubes and ovaries were again minutely examined and found to be normal. The ovum and myoma were removed. After 11 days the patient left hospital convalescent.

Schmid points out that (1) the ovum could not have had connexion with the tubes or ovaries for these were unaltered. Also the peritoneum was

normal except the bleeding patch on the posterior wall of the cervix caused by the loosening of the placenta.

(2) Judging by the length of the fœtus and the differentiation of the chorion the age of the ovum was estimated at 8-9 weeks. An ovum of this age of which the fœtus showed no sign of maceration must have lived.

(3) The ovum must also have been in living connexion with its matrix, because it was observed microscopically that the blood vessels of the villi were full of blood-corpuscles, and blood was detected in the intervillous spaces. This, taken in conjunction with the non-maceration of the fœtus, proved living connexion between fœtus and matrix.

Evidently the ovum had developed on the anterior wall of the pouch of Douglas. The physician's examination had caused rupture at an early stage. Had it developed further the placenta would probably have extended over the broad ligament, and later, it would have been more difficult to say that there was no connexion between the ovum and the tube or ovary.

Excessive uterine decidual hyperplasia in tubal pregnancy. The occurrence of excessive decidual hyperplasia in uterine pregnancy has often been observed, but a curious case of decidual hyperplasia occurring in a tubal pregnancy is published by Speiser. The patient, aged 39, was admitted to hospital for immediate operation for ruptured ectopic gestation. Laparotomy showed a ruptured right tubal pregnancy. The patient died five hours after the operation.

The post-mortem examination revealed extensive chronic adhesive perimetritis, extreme hyperplasia of the decidua uteri, cystic corpus luteum on the right side, and ovarian fibroma on the left. The adnexa were matted with numerous adhesions to the uterus. On microscopic examination it was found that the thickness of the uterine mucosa was over 1 cm. Normally at the end of a three months' pregnancy the decidua would be 5-7 mm. thick. In this case it was double this thickness in 10 weeks. The decidual cells were round or polygonal with enlarged glands and dilated blood vessels scattered between them. In many parts of the mucosa there was marked round-celled infiltration. The author considers that the decidual hyperplasia had a constitutional basis, and probably to some extent preceded though intensified by the pregnancy.

Simultaneous bilateral tubal pregnancy. On account of its rare occurrence Bordjoschki thinks it of interest to describe the following case on which he operated in October, 1922.

The patient, aged 32, was married when 19. In her 25th year she was in hospital for metritis and parametritis for two months, and since then has had two normal labours. Menstruation last occurred one month before admission and continued till admission when pain became very severe. The vagina was full of blood, the uterus enlarged and on either side was a hard mass. From that on the left the uterus could not be separated. The right one was freer and smaller. The patient declined operation and received medical treatment, which seemed to improve the condition. On the 4th of November pain recurred and was severe and continuous. The patient now desired operation. Laparotomy was performed. There was no free blood in the abdominal cavity, but great effusion was present in the pelvis. The uterus, left adnexa and rectum

were embedded in a mass of clot, and the whole was covered with a smooth bluish membrane. The right tube showed a swelling about the size of an egg at the ampullary end. This was connected with the uterus by an apparently normal section of the tube about 5 cm. long. The tube was bent sharply at right angles, and above and in front of the swelling was adherent to the broad ligament. Between the right and left tubes lay the enlarged ovary. The ampullary end of the right tube was closed with a bluish membrane. The fimbriæ were not visible. The left tube was stretched and was torn at its peripheral end. The left ovary was congested. No corpus luteum was visible. The tubes were removed but the ovaries were left. Uterine hæmorrhage ceased immediately after operation, and the patient made a good recovery. After hardening the distended right tube was found to contain a tubal mole. A cavity in its wall showed the resting-place of the ovum. Apparently the ovum in each tube originated from the right ovary. Probably the fertilized ovum on account of its size could not pass through the left tube. Passage through the right was also impossible because of the sharp bend. Entrance had taken place through the abdominal end, which later had become closed by the growth round the fœtal sac. The date of pregnancy could not be estimated.

The points noteworthy about the case are: (1) Simultaneous growth in each tube along with regular periods, and (2) occurrence of rupture of the left tube with right pelvic pain and no other peritoneal symptoms. This is explained by the fact that the growth of the villi in the tube-wall was not violent, and that erosion of the larger vessels preceded it causing gradual rupture. On the right, because of the tubal mole, no rupture had occurred. The tube had vainly tried to free itself from its contents, and caused the severe pain.

A certain early diagnostic sign of extra-uterine pregnancy. Banki alludes to Werth's comparison of extra-uterine pregnancy to an explosive substance which should be removed from the organism before explosion occurs. Most extra-uterine cases, however, come under observation when explosion has already occurred—they have ruptured or ended in tubal abortion, with grave symptoms of shock and peritoneal trouble.

As a result of long experience of early cases of extra-uterine gestation, Banki concludes that before rupture there is trickling of blood into the pouch of Douglas, with the formation of inflammatory adhesions. In these early stages patients frequently complain of tenesmus, rectal irritation and pain on defæcation. Whenever tubal pregnancy was suspected Banki found that if, on vaginal examination, raising of the uterus from the posterior fornix as if to press it against the symphysis, caused the patient sudden sharp pain, it was very frequently a sure diagnostic sign of tubal pregnancy. In most cases when he made this diagnosis subsequent operation confirmed its correctness. Other diagnostic signs, such as the phrenic symptom, shoulder pain, and so on, usually occur only when there is already extensive bleeding. This sign alone may not be absolutely indicative of extra-uterine gestation, as it may take place with recent parametritis or abscess in the pouch of Douglas. It may fail when there is previous growth filling the pouch of Douglas, but generally it may be regarded as an indication of extra-uterine pregnancy and a contra-indication to clearing the uterus. J. H. FILSHILL.

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*Maceration of the skin in a live-born child. W. Koerting.

*The result of supravaginal amputation and castration in tuberculous pregnant women. F. Siegert.

*The development of the placenta in the decidua reflexa. A. Seitz.

*A study of the anæmias in pregnancy. A. Alder.

Changes in the leucocytes during pregnancy. A. Heyn.

Acute hydramnios. S. Goldschmidt.

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Idiosyncrasy to scopolamine. H. Strube.

*The problem of extra-genital cyclic disturbances in women. O. Bockelmann and J. Rother.

The relationship of the female reproductive organs to basal metabolism. L. Kraul and G. Halter.

Pharmacological investigations on the uterus. H. Schultheiss.

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*Volumbolometric investigations in healthy and unhealthy women during pregnancy, labour and the puerperium. W. Haupt.

*Ichthyosis congenita. G. Hirsch.

*Gland tissue in the uterine scar after Cæsarean section. F. C. Geller.

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Active participation of the fœtus in the mechanism of birth. H. Sellheim.

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*On the pathology and therapy of malignant ovarian tumours. E. E. Pribram.

Clinical investigation into the action of crystallized lobelin on the respiratory centre in asphyxiated new-born children. P. Schumacher.

On changes in form of the skull in new-born children. W. Vogel.

The treatment of febrile abortions, with special reference to the bacteriological findings. E. Henrard.

The implantation of closed accessory cornua into the uterus. P. Strassmann.

Secondary implantation of the Fallopian tube into the uterus. P. Strassmann.

Volumbolometric investigations in healthy and unhealthy women during pregnancy, labour and the puerperium. The author has used Sahl's volumbolometer to investigate the circulatory changes throughout pregnancy, labour and the puerperium. The absolute volume and the work-value of the radial pulse are increased during pregnancy and reach their highest value in the first three months. During normal labour the work-value of the pulse shows further increase in the interval between pains, but this is only due to increased arterial tension: the volume, however, is less than during pregnancy. During the pains the work done per minute also

appears higher, owing to increased blood-pressure. While the volume per beat appears to be less, the volume per minute during labour is unaltered.

During the puerperium there is a marked diminution of the work-value and of the blood-pressure, also a less marked diminution in volume. As in non-pregnant individuals the absolute volume and the work-value of the pulse are higher while the patient is lying than while she is sitting, and are also higher in younger patients. Strangely enough multiparæ have a higher work-value than primiparæ. The resistance of the peripheral circulation is increased in pregnancy, and in labour, especially during the pains; but, in the puerperium it tends to drop to the values found in the non-pregnant. After sharp hæmorrhages, the estimation being made 24 hours later, the pulse volume as a rule is high and the pressure normal. In nephritic and pre-eclamptic cases the volume and work-values were increased to a moderate degree, but in an actual eclamptic the work-value was increased very much as a result of high blood pressure. In the last case the volume of the pulse was diminished.

Ichthyosis congenita. The author describes a case of congenital ichthyosis in which the fœtus appeared to be alive at the onset of labour, but was actually still-born. The skin changes were universal. Post-mortem examination of the child showed no appreciable abnormality of the internal organs, but the skin showed the characteristic hypertrophy of the horny layer with the formation of numerous small, specially horny spheres at the sites of the hair follicles. The author discusses the etiological factors in such cases, such as hereditary tendency to skin disease, to degenerative nerve lesions, consanguinity of the parents, and syphilis. In this case no such factor was present.

Gland tissue in the uterine scar after Cæsarean section. The author had the opportunity of examining the wall of a uterus, removed by hysterectomy some years after the patient had been subjected on two occasions to a classical Cæsarean section. At the later Cæsarean, some 14 years before the hysterectomy, the first Cæsarean scar was known to have been excised, and the uterine wall to have been stitched with a deep layer of catgut, which was passed through the endometrium, and with a superficial layer of catgut. The surface of the uterus was the seat of many adhesions, particularly along the scar which was obvious as a deep, vertical furrow on the anterior surface. In the region of the scar the uterine wall was thinned to quite one-third of its original thickness. The peritoneum was deficient. The bundles of muscle fibres were directed inwards on both the outer and inner surfaces, and converged into a mass of fibrous tissue in the centre of the scar. The author declares that histologically there was no tissue which could be accurately described as " scar " tissue. Particularly interesting was the fact that the endometrium penetrated very deeply into the inner surface of the scar, while just under the peritoneum there was an island containing undoubted endometrial tissue. At various places in the region of the scar there were scattered in the muscle tissue what appeared to be separate gland tubules. In one or two places there could still be found fragments of suture material surrounded by fibrous tissue. The distribution of the muscle fibres in the region of the endometrial tissue, which was scattered through the wall, was very characteristic. They appeared to surround the gland tissue in loops. The author believes that the deep

gland tissue, particularly that which lay isolated under the peritoneum, had arisen from fragments of endometrium conveyed there by the needle during the suture of the uterine wall. The irritative nature of this growth was shown by the arrangement of the surrounding tissue. The author points out to what a great extent the integrity of this uterine wall had been disturbed by not only the deep furrow of endometrium, which lay at the inner margin of the scar, but also by the implanted tissue in the muscle wall. The risk of rupture during a subsequent pregnancy would be greatly increased by this tissue undergoing decidual change.

Maceration of the skin in a live-born child. The author reports a case of considerable medico-legal interest, in that maceration of the skin has been accepted as a sign of intra-uterine death. In this case the child was born spontaneously at the end of a fairly short labour, no evidence of fœtal distress having been noted at any time. The child showed widespread maceration of the skin over all parts of the body except the face. The surface of the placenta, cord and membranes, were stained greenish with meconium, and the amniotic fluid also was green. The Wassermann reaction of both mother and child was negative, and the skin condition did not resemble simple congenital pemphigus. There was vigorous desquamation at the end of six days, and all signs of maceration quickly disappeared. The author suggests that the maceration was due to the action on the fœtal skin of some meconium which had been passed at some time before the onset of labour.

The result of supravaginal amputation and castration in tuberculous pregnant women. The author reviews the present position with regard to the association of pregnancy with pulmonary tuberculosis. He compares results of interference in pregnancy with expectant treatment. In his own series of cases he has taken great pains to ascertain by X-ray examination, the type and the extent of the progressive pulmonary lesion before deciding on interference. He agrees with the poor prospects of interference in the later months. He reviews also the various types of surgical interference practised in pregnancy. In the Freiburg klinik the method of choice is supravaginal hysterectomy, with removal of both tubes and ovaries. Before the fourth month this operation can be very speedily carried out. The extensive character of the operation has made the author fairly conservative in advising it in cases where the patient has not already given birth to healthy children. Following this extensive extirpation, there is no risk of sepsis in a recently emptied uterus; there is no periodic blood loss to diminish the patient's strength at a later date; the prospect of calcification of the pulmonary lesion is improved; the production of a premature menopause is very often followed by the deposit of adipose tissue, a very desirable result in tuberculous patients. The author subscribes to Lindig's theory that it is wrong to leave ovaries when the uterus is removed, on the ground that the uterus performs some type of excretory function for the ovaries. He gives the results of 26 such cases treated in the Freiburg klinik since 1918. Twenty were improved, of whom 12 indeed were regarded by the consulting physician as completely cured; four cases were not improved and died from one to eleven months after the operation; two cases could not be traced.

The development of the placenta in the decidua reflexa. The author makes a contribution to the study of low implantation of the placenta from a case in which the uterus had been removed during the third month of pregnancy on account of progressive pulmonary tuberculosis. The placenta was found situated on the posterior uterine wall with a distinct lobe passing across the cervical canal to reach the anterior walls of the uterus. Histological examination of the gland tissue in the decidua showed that, while the original implantation had taken place in the lower portion of the uterus, it did not occur as far down as the isthmus. The abnormal placental lobe in this case was therefore developed in the decidua reflexa. For such development, the conditions usually present are a primary embedding of the ovum in the lowermost portion of the uterus, a very deep penetration of the ovum into the endometrium with consequent deficiency of the decidua basalis, and an ample blood supply for the decidual tissue in the region of the persistent villi of the chorion læve. All those conditions were fulfilled in the above case. The aberrant placental lobe, however, lay completely above the level of the isthmus. The extent to which this abnormality might have given rise to severe bleeding in the later months of pregnancy is uncertain, but the great vascularity of the decidual tissue in this placenta reflexa makes it appear a greater factor in the production of a " clinical " placenta prævia than Bumm believed.

A study of the anæmias in pregnancy. With a view to obtaining a clearer idea regarding the pseudo-pernicious anæmia of pregnancy, the author made a study of 50 pregnant women in whom anæmia had been diagnosed. In a normal pregnancy there is a considerable destruction of blood cells in the placental area, and so there is normally an increased activity on the part of the bone marrow to replace the deficiency. The author divides his cases into those in which there was a " proved " anæmia before conception, which class includes active chlorosis, post-hæmorrhagic anæmia and leukæmia, and those in which there was no trace of anæmia before conception.

He finds in the first group that the blood picture is always that of an oligochromæmia, whereas in the second group there is always an oligocythæmia. The chlorotic cases of the first group were the most frequent, with a colour index varying from .5 to .8, and responding well to treatment with iron. The post-hæmorrhagic type had exactly the same picture as the chlorotic type, but did not respond so well to treatment.

In the second group are found those cases in which there might be said to be the " physiological anæmia of pregnancy," viz., cases in which the bone marrow has not responded adequately to the physiological blood restruction. The reduction of red blood corpuscles and hæmoglobin is equal, and consequently the colour index remains normal. This sub-group may be further divided into those in which the regeneration is of the normal type as shown by a perfectly normal blood film, and those in which the lesion has been more extensive, and where consequently a large number of immature blood elements, such as normoblasts, basophil leucocytes, etc.; appear in the films. This type is the result of excessive regenerative processes, and has nothing to do with the pseudo-pernicious type.

From this the author proceeds to the study of three cases of the pseudo-pernicious anæmia of pregnancy. These cases presented red blood corpuscle changes in shape and staining character, corresponding to those of true

pernicious anæmia, but the leucocyte changes were more indicative of excessive stimulation of the bone marrow, and even the blood platelets were increased in number.

Passing from the consideration of his own cases to a review of those which have been published, the author finds that in all the records there is a history of previous impairment of the blood-forming tissues caused by chlorosis, severe post-hæmorrhagic anæmia, or syphilis. He believes that this type of case does not result from toxæmic changes due to pregnancy, but from the impaired response of an already damaged bone marrow to the physiological stimulation of pregnancy.

The problem of the extra-genital cyclic disturbances in women. The authors have investigated the metabolism of a considerable number of women in and through different phases of reproductive life. Using the most modern methods they have tested the alkaline reserve of the blood and the CO_2+ tension of the alveolar air. They find that throughout active reproductive life there is a periodic change in these, corresponding to the periodicity of menstruation. The CO_2+ combining power of the blood and the CO_2+ tension of the alveolar air reach the lowest level in the pre-menstrual phase, and the highest level in the post-menstrual, or at the beginning of the inter-menstrual phase. There may be said to be a slight acidosis in the pre-menstrual phase. When there is an arrest of the menstrual function, for example after surgical removal of the reproductive organs, the periodic variation is lost. This variation is not the result of actual menstrual changes, such as loss of blood, but forms part of the periodic, metabolic changes in female reproductive life, of which menstruation is only an example.

On the pathology and therapy of malignant ovarian tumours. The author has investigated all the cases of malignant ovarian disease dealt with in the Giessen klinik over a period of ten years. A study of those cases shows that primary ovarian carcinoma is usually unilateral. It does not spread through the lymph stream, but is liable to form contact or implantation metastases on the surface of the neighbouring peritoneum, or on the surface of the uterus. Secondary ovarian carcinomata arise most commonly from a primary tumour in the intestinal tract or in the gall-bladder, and the actual point of origin may be a very small portion of tissue: they are almost always bilateral. The uterus and tubes are not affected except through the lymphatic stream. In the secondary type a radical operation should be attempted, with a removal at the same time, if possible, of the primary malignant growth. Implantations on the peritoneum should be carefully excised and the deficiencies covered up, either by plastic means, or by covering the bare area with omentum. The results for sarcomata are better than for carcinomata, the former having very seldom metastatic growths. Secondary ovarian growths are much more common before the menopause than after. The results of X-ray treatment have been very disappointing. The post-operative radiation of the whole abdomen in a prophylactic way has increased the number of permanent cures.

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An improvement in the Abderhalden reaction and its application to some problems in midwifery and gynæcology. Sellheim and his assistants have devised a means of simplifying the Abderhalden reaction by using 96 per cent. alcohol to precipitate the protein bodies, instead of dialyzing the solution. This renders the reaction quantitative, more specific and more rapid, which alone may be valuable as in diagnosing an ectopic gestation. The change from chemical to physical methods renders the reaction more reliable (98.7 per cent. as against 78 per cent.) and more exact. Various investigations, facts and suggestions follow this improved method. It has been shown that the proteolytic bodies are present in the fœtal blood, which renders it unreasonable to consider them a sign of protective measures in the mother against the child. The interchange of chemical substances between mother and child has been studied and shown to be partly selective. The sex of the fœtus can be ascertained by a positive or negative reaction in the maternal blood with testicular extract. The determination of sex of twins is discussed as regards the interaction of male and female tendencies of two fœti. The influence of fœtal products on the mother causes a local rejuvenation and growth. Changes in the blood after the climacteric, operative castration or X-ray treatment, show the last to cause an artificially diseased condition of the ovaries.

Methods of examining the cerebrospinal fluid can be improved similarly and rendered more accurate. The degree of putrefaction of meat can be estimated. It can be shown that the normal method of carrying amino acids in the blood is in the red corpuscles. With regard to cancer, a positive reaction can sometimes be obtained before clinical manifestations occur, and it is hoped that methods of checking its development through the blood may be found in the future.

Is true menstruation possible in pregnancy? The means of determining whether a vaginal hæmorrhage during pregnancy is a menstrual one, are the presence of fragments of uterine mucous membrane, the presence of a corpus luteum, and the time with regard to the previous period. Wintz reports several cases where one or more of these details could be ascertained and pointed to true menstruation in the early days of a pregnancy. In two cases it was possible that the ovum was still in the tube or embedded in the tubal angle, or that the spermatozoa survived four or five days in the tube to await an ovum at the following menstruation.

The production and influence of increased intracranial pressure on the fœtal heart sounds during labour. After considering the acute and the gradually developing types of increased cerebral pressure, and their effect

in slowing the fœtal pulse, Esch lays down the following rules for treatment:—Wherever a manifest pressure occurs, as also where the pulse is slowed in consequence of increased carbon dioxide in the blood, delivery should be hastened even when the fœtal heart has returned to a normal rate. If the conditions for forceps are not obtained, especially if the head is not yet in the true position, the risk of increasing the cerebral pressure by a forced delivery is greater than that of waiting till the conditions are ripe for forceps.

Principles of the technique of clearing out abortions. Von Franqué lays down the following rules for clearing out an abortion:—

(1) The cervical canal must always be dilated to admit at least one finger. An anæsthetic should be given.

(2) A purely instrumental method is only permissible up to the ninth week, and only with a large blunt curette.

(3) Later, the finger should always be introduced to loosen the ovum, and the curette only used to remove the pieces and to scrape off a few last fragments.

(4) Forceps of any sort may only be used to remove parts lying free at the internal os. If introduced any further, they must always be guarded by the finger, and if the os does not permit this, the uterus must be packed, and drugs given till sufficient dilatation has occurred.

(5) After the third month the delivery should be left to the uterine pains after packing, or perhaps after introducing a bag, where bringing down a leg does not stop the hæmorrhage.

The significance of tests for syphilis during pregnancy. Out of 335 women who were examined for syphilis, during pregnancy and at term, 22 gave positive tests; of their children the umbilical blood was positive in 10 cases, and four of these died in the first few weeks of life, though none showed any signs of syphilis at birth. Examination of the milk gave positive results in some cases, though it was suggested that this result might be reversed by boiling for a very short time. The importance of examining all cases and instituting early treatment was emphasized.

Prophylaxis and treatment of late retention of placental fragments after full-term deliveries. The prophylaxis of retained placenta depends on the care taken to avoid incomplete separation of the placenta and to detect any defect where this has occurred. The careful management of the whole of labour, and especially the third stage, is essential. Where delay occurs in the birth of the placenta, Mojon Gabaston's method of distending the placenta with cold liquid is very valuable where there is little or no hæmorrhage. Crédé's method should not be used before distension, as it may cause laceration of the placenta and render the distension impracticable. Crédé's method may be used second, and finally, if necessary, manual removal must be undertaken. The determination of the completeness of the placenta is facilitated by distending it with milk. Where none appears on the maternal surface, the placenta is intact. This simple procedure has saved many useless explorations. Manual removal must be undertaken whenever any fragment larger than a hazel nut is retained. Where the condition is met with during the puerperium, expectant treatment may sometimes be adopted with good results. Wagner has devised a

method of digesting the fragments with a pepsin and hydrochloric acid solution, which does not open the maternal circulation, but it has not yet been used often enough to give conclusive results.

Retained placenta and exploring the uterus. Pankow, after stressing the importance of not massaging the uterus in the third stage of labour to avoid interference with the separation of the placenta, strongly advocates immediate removal of any piece of placenta, however small, which is left in the uterus.

A new narcosis in obstetrics. Stein describes a method which has given him good results. It consists of an injection of .006 gr. morphia and 2 cc. 50 per cent. magnesium sulphate, given at two finger dilatation of the cervix; the sulphate may be repeated later. When the os admits three fingers, a rectal injection of quinine (0.6), alcohol (8), ether (70) in olive oil (120) is given. The patient falls asleep while the uterus continues to contract painlessly. Stein also advocates the use of repeated very small doses (two drops) of pituitrin to stimulate and strengthen labour pains.

Sacral anæsthesia. Eymer brings forward the merits of sacral anæsthesia—the slow injection of a solution containing novocaine through the lowest sacral foramen without piercing the dura—for major operations, especially for laparotomies.

Kielland's forceps and Cæsarean section. Fraenkel suggests that in cases where it is doubtful, whether the fœtal head will go through the pelvis, it is worth while to try Kielland's forceps before performing Cæsarean section. This should be done in the operating theatre, so that Cæsarean section can follow immediately, if necessary, when the increased risk of sepsis should be very small.

Prognosis and treatment of vesicular mole. Essen Möller has collected 50 cases of vesicular mole, eight of which later developed chorion epithelioma. Five of these women were over 45 years old, and if this represents a real increased risk of malignancy at this age, Essen Möller suggests the propriety of considering a hysterectomy at the stage of vesicular mole in these older women.

Individual treatment of myomata. The importance of considering each case individually, as regards age and restoration of function, is strongly emphasized by Henkel. Where a choice must be made between interfering with child-bearing or menstruation, he considers the latter more important, especially in young women. For this reason he advocates as conservative a treatment as possible. In some cases curetting has sufficed to relieve the symptoms, though of course it is only to be used where the inner surface of the uterus is smooth. X-ray treatment may be valuable, but the number of suitable cases is restricted by age and the presence of complications. In doing a total hysterectomy he has devised a method of opening the vagina at the side first, which diminishes the risk of hæmorrhage.

Corpus luteum cysts or cystic corpora lutea. Schröder points out that this distinction is purely artificial, and concludes the latter is the more accurate

term. In considering a series of cases he found no definite symptoms associated with the condition, which was frequently found accidentally at operations for other conditions. All the changes of a normal corpus luteum are found in a cystic one, which may be formed because of some flaccidity or scarring due to previous local disease.

Critical consideration of psychotherapy in gynæcology. Von Jaschke protests against the tendency to consider symptoms due to psychological conditions, and suggests that the high figures for cases of this nature given by some authors are due to the fact that they themselves are known to be interested in these matters.

The effect of profuse venesection in eclampsia. The action of large venesection in eclampsia is primarily a detoxicating one, the questions of reflex effects and lessening of the viscosity of the blood being secondary. The diminution in the blood pressure is a measure of the effectiveness of the venesection. A fall in blood pressure due to drugs has not the same good effect as that due to withdrawal of blood. The detoxication takes place by removal of fluid from the tissues into the blood stream, therefore as much blood as possible should be removed; this is not dangerous in eclampsia as long as the blood pressure is still raised.

Further experiences of stimulant treatment by X-rays. Flatau points out the importance of selecting suitable cases and of proper technique and dosage in using X-rays for stimulating the ovaries in primary amenorrhœa. He has obtained good results in treating these cases, and in cases of sterility. Careless and wholesale use of X-rays only brings a valuable remedy into disrepute. He has endeavoured to check the menorrhagia of puberty by X-ray application to the spleen, but as yet in too few cases to give any conclusive results.

A contribution to the question of fœtal hormones. Lüttge and v. Mertz have shown that the blood of a pregnant woman reacts with testicular extract, where the child is a male. No action has been obtained with seminal fluid.

Variations in the blood proteins in pregnancy, labour and the puerperium and their significance. The fibrinogen content of the blood increases during pregnancy, rises still further during and after labour, and slowly returns to normal during the puerperium. The globulin shows a similar change to a less marked degree, while the albumin content varies in the inverse manner. The increased fibrinogen plays some part in the raised liability to thrombosis after labour.

Injury to the child by intra-uterine manipulations. A high fœtal mortality, averaging 50 per cent., is demonstrated by Winter, where delivery has not followed at once in cases of version for breech or transverse presentations, or other manipulations such as the bringing down of an extended leg, the flexion of a partially extended head, or the rotation of an occipito posterior presentation. Winter gives prolapse of the cord, and partial separation of the placenta as causes for the asphyxia, which underlies this high mortality, but believes the more important reason lies in the stimulating action

on the child's skin, which causes premature expansion of the lungs (as air is let into the uterus during the manipulation) and so an impediment to the placental circulation. He therefore recommends that these methods of treatment should be left till the cervix is just fully dilated, so that extraction can follow if spontaneous delivery does not occur very shortly. Even where the membranes have ruptured early, he considers it safer to wait.

Spontaneous delivery of mature children in brow presentations, with a recommendation of Kielland's forceps. Fink describes three cases of brow presentations, one naso-anterior, one naso-posterior, and one in the transverse diameter, where spontaneous delivery of children, averaging 6½—9 lbs. in weight, occurred. He therefore puts forward a plea for expectant treatment in brow cases, with the application of Kielland's forceps in skilled hands, if necessary.

Remarks on amniotic hydrorrhœa. Is there a decidual hydrorrhœa? Schmidt divides amniotic hydrorrhœa into a simple form, hydramnios and exochorial pregnancy. The latter occurs when the secretion is increased in the early months of pregnancy, and a rupture of the membranes allows fluid to pass between the chorion and the decidua, so that the membranes shrivel, the placenta is distorted and the fœtus comes to lie outside the membranes where it is deformed by pressure. Later in pregnancy simple hydramnios occurs, as the fusion of the decidua and chorion prevents rupture anywhere but at the os. The so-called decidual hydrorrhœa Schmidt believes to be really of the amniotic type.

The etiology of retroflexion of the uterus. Hochenbichler believes the state of turgidity of the uterus to be an important point in the etiology of retroflexion, especially as the patient is often of an asthenic type. In several cases he has demonstrated the good effect in correcting the displacement of distending the uterine arteries in the cadaver.

Castration and climacteric symptoms. Wolmershäuser has used X-ray exposures to the ovaries to check uterine hæmorrhage due to myomata, and at the climacteric, with very good results. The treatment was most reliable when given within 13 days after the onset of menstruation, while dosage, age and latency of reaction influence the result. With smaller doses he successfully produced temporary castration with amenorrhœa, especially in pelvic peritonitis and general conditions such as pulmonary tuberculosis. Symptoms usually associated with the menopause—flushes, flatulence, constipation and mental symptoms—occurred as after operative castration, but were relieved as soon as menstruation reappeared.

The psychiatric and neurological indications for sterilization of women. A pregnancy after repeated attacks of dementia præcox should be terminated, and sterilization performed, but in most other mental cases, as in maniacal depressive insanity, the patient's condition varies so much that general rules cannot be laid down, from the clinical, as opposed to the eugenic, point of view. The effect of a previous pregnancy on the mental condition is of value in coming to a decision.

The conservatve treatment of chronic gynæcological diseases, with results of Jothion therapy. Sserdjukoff has used " Jothion "—an organic prepara-

tion rich in iodine—with satisfactory results in a great variety of cases—urethritis, vulvovaginitis, cervicitis and endometritis with displacement of the uterus. This is partly due to a direct local action, and partly to absorption into the blood with consequent resorption of inflammatory exudates and marked relief of symptoms.

A further contribution to the study of carcinoma of Bartholin's gland. After reporting a case Neuwirth points out that a circumscribed hard tumour, situated in the posterior half, generally of the left labium majus, and causing dyspareunia in a woman of 50—60 years, is very suggestive of a carcinoma of Bartholin's gland. The growth is usually not attached to the skin and not ulcerated. There has been much discussion as to whether it is of the squamous or columnar type. X-rays and radium are useful in the treatment of the condition.

Why and to what purpose do we investigate the constitution? Kirstein emphasises the importance of investigating patients in mind as well as in body with the utmost thoroughness in order to arrive at a correct and well-balanced view of each case.

Proof of the transferability of œdema in pregnancy. A special balance was used by Bund, in which women were balanced repeatedly for an hour or more after lying down, and the following results were obtained:—

In all pregnant women tissue fluids flow towards the head on lying down; this reaches a constant level in 1¼ hours and increases in the later months of pregnancy. Very little change occurs in non-pregnant cases, while in pregnancy with œdema the transference of fluid is generally about one-third as great again as in normal pregnancy.

Fick's work was confirmed in that blood flowed towards the head in the first five minutes after lying down. A theoretical point of value is that eclamptic symptoms may be precipitated by laying a patient down with the feet raised.

Investigation of the field of vision in pregnancy. Examination of 56 pregnant women showed no change in the visual field suggestive of pituitary enlargement, though variations of functional origin, due to fatigue, lack of concentration and impatience, were of more frequent occurrence before than after labour.

Abnormal labour in so-called partial retroflexion of the uterus, and its treatment in cases of advanced pregnancy. Katz describes a case of a retroflexed gravid uterus where the anterior wall had expanded to take the fœtus; after the belated onset of labour and death of the child a hysterectomy was performed. Where the diagnosis is made early he believes Cæsarean section with or without hysterectomy is useful in the treatment of these cases, in view of the high fœtal mortality. Pressure on the ureters he considers may cause eclamptic symptoms.

Delivery in placenta prævia without hæmorrhage. Liegner describes a case where a placenta prævia was diagnosed at the sixth month, and yet delivery occurred 11 weeks later without any hæmorrhage. The explanation lay in the constitution of the placenta, which lined almost the whole of the uterus, except for an area at either pole where the placenta was atrophied and bloodless.

Experiments with Philipp's test for virulence in puerperal infections. Philipp's test for virulence in puerperal infections consists in treating the vaginal organisms with the blood of the patient and ascertaining whether the number of colonies, which can be grown, is increased or lessened, by leaving the blood and organisms together for an increasing length of time. The results of tests have been satisfactory, and have sometimes given a correct prognosis earlier than the clinical condition. It is exceptional for the test to fail, but it needs rather too much equipment to be generally applicable at present.

On the relation between the sedimentation rate of blood corpuscles and the agglutination of bacteria. Working with the sera of puerperal women and women suffering from inflammatory diseases (who show a rapid sedimentation rate), normal serum and serum from the umbilical cord of the newborn (slow sedimentation rate), Mandelstamm concludes that there is no invariable relation between the agglutination of bacteria and erythrocytes, though the sera with the rapid sedimentation rate have a greater tendency to agglutinate bacteria. The reaction varies with the properties of the sera and the structure of the organisms.

A study of cases of death in the puerperium during the last 26 years. A total mortality of 63 cases (.3 per cent.) was accounted for as follows :—19 cases were examined and presumably infected before admission. Ten cases were infected from some autogenous source, such as an old cystitis, mastoid or other abscess, or tonsillitis, while in 14 spontaneous and 20 operative deliveries the infection must be laid at the obstetrician's door. Cæsarean section, manual removal of the placenta and placenta prævia show the highest number of deaths, and in several cases the infection was already present ante-partum.

A sacral teratoma. In this case the tumour, which was derived from all three germinal layers, grew rapidly after birth, and was successfully removed on the 15th day. It was believed to be of parasitic type, and was removed on account of the strain on the child's nutrition, as well as the suggestion of malignancy.

Congenital skin defect in the scalp of a newborn child. The skin defect, after undergoing aseptic necrosis, healed in the course of time, though at 16 months only lanugo-like hairs were to be seen over the affected area. Th etiology was obscure in this case, but a hereditary factor was suggested by the fact that the mother's first child (a breech presentation) showed the same condition.

DOROTHY N. L. LEVERKUS.

Medical Science: Abstracts and Reviews.

The following abstracts are reprinted from " Medical Science, Abstracts and Reviews," by kind permission of the Medical Research Council.

Antiscorbutic potency of whole milk powder. R. A. Dutcher and J. S. Hall. *Industrial and Engineering Chem.*, 1924, 16, 1070-3. Abstracted from " Medical Science : Abstracts and Reviews," 1925, xi, 5 335.

Various observers have found that powdered milks prepared by the

roller process contain an appreciable amount of vitamin C, whereas most samples of spray process milks contain little or no antiscorbutic. This absence of antiscorbutic has been attributed to the prolonged exposure to hot air milks dried by the spray process. These observations have been vitiated by the fact that the antiscorbutic power of fresh milk varies considerably with the season of the year and the nature of the cow's food, and no one has previously examined the antiscorbutic power of the same milk before and after drying.

The authors have taken a sample daily from the mixed milk of a large herd of cows, and have fed it in the fresh state in suitable quantities to large batches of guinea pigs on a diet containing no other vitamin C. Immediately after the samples were taken the milk of the herd was dried by the Merell-Soule process, which consists in condensation *in vacuo* in a steel container, pasteurization at 145° F. for thirty minutes in a glass container and spraying into a hot-air chamber. Drying is instantaneous, but the powdered milk lies on the floor of the hot chamber for two hours or more. During condensation and pasteurization air is excluded.

A daily sample of the dried milk was fed to other large batches of guinea pigs similar to those fed with the same milk whilst fresh. To the surprise of the authors the mean weight curves of batches of guinea pigs fed on equivalent amounts of the same milk fresh and dried were almost exactly similar, and where the doses of dried milk were insufficient to prevent scurvy the disease developed at the same time and to the same extent in the corrsponding batch of pigs fed on fresh milk. They conclude that there is no evidence that any vitamin C is destroyed by the Merell-Soule spray process of drying milk. J. L. PRISTON.

The effect of ovarian extracts upon the spontaneous contractions of the Fallopian tube of the domestic pig. D. L. Seckniger. *Am. Jl. Physiol.*, 1924, 70, 538—549. Abstracted from "Medical Science: Abstracts and Reviews," 1925, xi 5, 351.

This paper considers the action of ovarian extracts upon the contractions of the Fallopian tube of the domestic pig with reference to the œstrous cycle. The recognition of the cyclic variations in the type of spontaneous contractions of the tubal musculature is of recent origin, and has been especially taken into consideration in this work.

Various ovarian extracts were experimented with. It was found that corpus luteum extracts exert a specific action upon the excised Fallopian tube of the domestic pig though its action varied in tubes of the œstrous and interœstrous periods.

The corpus luteum substance, which was found to be active upon the Fallopian tube, also caused a marked contraction of the vas deferens of the val. Extracts from the mature Graafian follicles, the recently ruptured follicles and the stroma of the ovary were found to exert little if any effect upon the tube. H. GARDINER HILL.

Adenofibrosis and adenomyosis of the female genital apparatus. E. Stübler *Zentralbl. f. Chir.*, 1924, 51, 2573. Abstracted from "Medical Science: Abstracts and Reviews," 1925, xi, 5, 376.

The author draws the attention of surgeons to adeno-fibrosis and adenomyosis as being one of the less recognized gynæcological affections which are liable to be mistaken for acute appendicitis, and are therefore of indirect

surgical interest. The typical situation of the lesion is in the uterus where it forms a diffuse thickening of the inner layers or appears as a well-defined tumour. In either case it has a mixed structure consisting of muscular or fibrous tissue permeated with gland-like spaces which are surrounded by a cytogenous zone resembling stroma of the uterine mucosa. The same lesion is, however, met with in the ovary, the broad and round ligaments, and in the rectum, sigmoid, appendix, and loops of bowel lying in the pelvic cavity. The primary seat of the change is sometimes in the uterine mucosa, sometimes in the peritoneum, and in either case is held to have an inflammatory basis. Stübler considers that the process may also start from the surface epithelium of the ovary, leading to a diffuse adeno-fibrosis of the organ; and he states that the condition is responsible for a large proportion of ovarian hæmatomata. The tubular structures in the new formation are very liable to form cysts, and there, becoming distended with blood under the influence of the menstrual congestion, may rupture and produce peritoneal symptoms simulating those of acute appendicitis. Also, since adeno-fibrosis is inflammatory in nature, it may produce pain apart from and in the intervals of menstruation and should a gynæcological examination reveal little evidence of disease, as appears to be the rule in early stages of the affection, the condition is liable to be mistaken for chronic appendicitis. In these cases, apart from a careful gynæcological examination, the history may be of assistance in reaching a diagnosis; adeno-fibrosis occurs between the ages of 30-45; before 30 it is rare, and after 45 its effects are slight, especially if the menopause has occurred. Acquired dysmenorrhœa is one of the most characteristic effects. The surgical interest in adeno-fibrosis is further seen in cases where the affection involves the round ligament, especially in its extra-abdominal portion. Here the condition may be mistaken for hernia, and even for strangulated hernia, if the symptoms occur during menstruation, when the tumour may be markedly tender. Finally, when the condition originates in the serous covering of the bowel, it may lead to stenosis and produce appearances which, even at the operation, it may be difficult to distinguish from carcinoma.

T. W. P. LAWRENCE.

The bacteriology of human milk. L. S. Dudgeon and R. C. Jewesbury. *J. Hyg.*, 1924, 23, 64-78. Abstracted from "Medical Science: Abstracts and Reviews," 1925, **xi**, 5, 395.

The authors examined the milk from 100 women during the puerperium or at different stages of lactation. In the milk from mastitis the commonest microbe found was *Staphylococcus aureus*. From 49 per cent. of human milks streptococci were isolated, but there was no evidence that this was associated with any pathological process in the breast, although the number of streptococci in milks with a high incidence of polynuclear leucocytes was greater than in normal milk. Only 2 per cent. of streptococci in human milk were hæmolytic. In 10 instances *B. coli* was recovered from human milk. The authors emphasize the importance of a cytological as well as a bacteriological examination of human milk. W. BULLOCH.

The digestibility of fresh and sour cow's milk. Orla-Jensen and B. Spur. *Ngeskr. f. Læger.*, 1924, 86, 655. Abstracted from "Medical Science: Abstracts and Reviews," 1925, **xi**, 6, 423.

As the butter action of cow's milk is considerable, its digestion by the

pepsin of the gastric juice should be proportional to the latter's acidity. The authors have carried out systematic investigations to verify the above tests of the pepsin digestion of fresh milk and milk containing as much lactic acid as the more common sour milk preparations such as Yoghurt. In their tests the authors used sterilized milk to which they added 0.2 per cent. of pepsin and varying quanties of lactic and hydrochloric acids. The milk was first brought up to the dried temperature in a water-bath and then stirred in a thermostat at blood temperature. After giving further details of their technique the writers publish a table in the last column of which the pH values obtained are given. The conclusions to which the authors come is that sour milk is more readily digested than fresh milk.

C. LILLINGTON.

Non-rachitic softening of the ribs in infants and children. A. F. Hess. *Am. Jl. Dis. Child.*, 1924, 28, 568—573. Abstracted from " Medical Science : Abstracts and Reviews," 1925, xi, 6, 425.

The author contends that softening of the ribs occurs in infants aged one month and even in premature infants who show no sign of rickets by X-ray or by examination of the blood for a deficiency of calcium or phosphorus. When put on cod-liver oil, egg yolk, and given artificial sunshine, the softness of the ribs does not disappear. In the ten typical cases of this condition where the children were admitted in an under-weight condition to an institution, and where they were kept for a period of five years, their weight improved only very slowly and they developed gross bony deformity of the chest-wall—pigeon chest—without showing typical signs of rickets. The author does not mention the well-observed fact that rickets appears only in infants when actively growing, and from the case histories it would appear that these cases all remained infantile or tended to do so.

D. PATERSON.

Further observations on stillbirth and neo-natal death: their causes, pathology and preservation. F. J. Browne. *Edin. Med. Jl.* 1924, 31, *Trans. Edin. Obst. Soc.*, 156—201. Abstracted from " Medical Science : Abstracts and Reviews," 1925, xi, 6, 429.

The author has investigated a further 200 fœtuses of 28 weeks or over. He considers that fœtuses of less than 28 weeks present so many points of difference in their pathology that they should be dealt with separately. This investigation included a post-mortem and microscopic examination of the fœtus and placenta. A detailed history of the labour was taken and an examination of the mother, with a full history of her previous health. From these data an attempt was made to arrive at the cause of death. This was classified as ante-natal, intra-natal and neo-natal. By far the most common cause of ante-natal death is syphilis, and he gives in detail his method of examining a macerated fœtus to determine whether syphilitic or not. He lays stress on the decreased weight of the liver and increased size of the placenta in syphilis. He has never yet found spirochætes in the liver of an infant whose mother gave a negative Wassermann reaction, nor has he found spirochætes in the liver of a child whose mother had not a strongly positive Wassermann reaction. He does not consider, after examining 100 cases, that there is any evidence whatever for the statement that pregnancy modifies the Wassermann reaction.

From experimental evidence he considers that knots and twists in the

umbilical cord may play an important part in ante-natal death. He considers that our power to prevent ante-natal death is limited to cases of albuminuria and syphilis.

As to intra-natal deaths the commonest causes are traumatic in origin, and of these asphyxia stands first with cerebral hæmorrhage and craniotomy second and third. Of those children requiring craniotomy some had hydrocephalus, but the majority were due to contracted pelvis. Of deaths due to cerebral hæmorrhage the majority were vertex presentations, and of these less than half were delivered by forceps. He considers that breech delivery is ten times as likely to give rise to cerebral hæmorrhage as is delivery by the vertex. Cerebral hæmorrhage is seven times as likely to occur in premature infants as in infants at term. Tearing of the tentorium occurred in a number of cases without cerebral hæmorrhage.

As causes of neo-natal death pneumonia came first. The symptoms were as a rule quite unlike those to be expected, and consisted in cyanosis, cold extremities and skin, taking feeds badly and irritability. As to the prevention of still-births the author considers that in order to prevent asphyxia there is a strong case for the induction of labour ten days before term in primigravidæ unless the child is unusually small. The danger of breech delivery is pointed out and its prevention by manipulation. A special ward set apart for infants would probably result in a much diminished death-rate from infectious diseases such as pneumonia.

A bibliography is appended. D. PATERSON.

Experimental study of Abderhalden's reaction. W. Barikine and P. Zdrodovsky. *Ann. de l'Inst. Pasteur,* 1924, 38, 909—914. Abstracted from " Medical Science : Abstracts and Reviews," 1925, xi, 6, 480.

According to the authors, the defensive ferments of Alderhalden possess a real existence, but before they can become of use for diagnostic purposes some method for estimating them quantitatively must first be invented.

J. R. PERDRAU.

Granuloma inguinale. A. R. Fraser. *Brit. Jl. Dermat. and Syph.,* 1925, 37, 14-29. Abstracted from " Medical Science : Abstracts and Reviews " 1925, xii, 1, 7.

Fraser describes the condition known as granuloma inguinale and remarks that it is very prevalent in the coloured races in the Cape Peninsula. He goes on to describe the conflicting views which have been put forward as to its ætiology, and concludes that this is not yet settled. He finds the disease chronic and unhealing, and very resistant to treatment. He summarizes 18 cases. Tartar emetic was used in 16 of these. Six cases healed completely. In 10 there was no benefit from the intravenous use of this drug. In one case tartar emetic was not employed, and in another the condition healed after administration of sulfarsenol.

A striking feature of his report is that in no case was there observed the rapid healing following tartar emetic injections reported by some workers. On the other hand, when antimony failed other treatments were invariably unsatisfactory and seldom successful. Other treatments tried included arsenic, mercury, iodides, intramine, colloid manganese, colloidal sulphur, curetting, cauterization, excision and heliotherapy.

The article is illustrated with three photographs of penile lesions, and there is a bibliography of 32 references. A. C. ROXBURGH.

A case of virilism associated with a suprarenal tumour. G. Holmes. *Quar. Jl. Med.*, 1925, 70, 143—152. Abstracted from "Medical Science: Abstracts and Reviews," 1925, xii, 1, 28.

A case is recorded of a young woman in whom a large, slowly-growing tumour of the right suprarenal body was associated with changes in the sexual organs, disturbances of the sexual functions, alteration in the secondary sexual characters, and psychical changes, all of which symptoms disappeared within a relatively short time after the removal of the tumour and left the patient again an apparently normal woman. This case had been under observation for eleven years previously to operation and nine since.

Many similar cases from the literature are cited by the author and additional clinical evidence is put forward to show that disease of the suprarenal cortex, and especially such forms as increase its functional elements, can influence the development or state of the sexual system. The author considers that the cases recorded, and especially those in which, after removal of the tumour, the symptoms disappeared, afford evidence that must now be regarded as conclusive that an internal secretion derived from the cortex of the suprarenal bodies, when in excess, tends in women to diminish the female and increase the male primary and secondary sexual characters. He also suggests that there is abundant evidence to show not merely that active growth and development, in abnormal as well as in normal circumstances, of certain organs of the body, and especially the sexual organs and related systems, are dependent on internal secretions, but also that the growth when attained requires the continuous influence of these secretions and in their absence may regress. H. GARDINER HILL.

The basal metabolism before, during, and after pregnancy. Sandiford and T. Wheeler. *Jl. Biol. Chem.* 1924, 62, 329—352. Abstracted from "Medical Science: Abstracts and Reviews," 1925, xii, 1, 29.

Several observers have reported that the total energy production of the normal pregnant woman undergoes little or no change in the beginning of gestation, but that during the latter part of pregnancy there is a gradual and significant increase.

The authors of the present communication have studied the heat production in one woman, before conception, during pregnancy and the puerperium, and for four months after the cessation of lactation and the re-establishment of menstruation, a period of 17 months. Their observations confirm the finding of a definite increase in the total heat production during the latter part of pregnancy, but they believe that their data, as well as those of other observers, show that the rate of metabolism of a unit mass of the mother's tissues undergoes no material change, and that the increase in the total heat production may be accounted for by the increase in the amount of active protoplasmic tissue which is composed chiefly of fœtus.

The increase in heat production in the present case began in the eighth and gradually increased to the tenth month, when the total calories were 25 per cent. greater than before conception.

There was no increase in heat production during lactation. In fact there was a slight decrease, probably because of the less active life. As the mother gradually resumed her usual activities the metabolism became almost identical with that before pregnancy. There were slight daily

irregular variations in the heat production after the re-establishment of menstruation but none which can be accredited to its influence.

H. GARDINER HILL.

Sacral nerve block anæsthesia. W. R. Meeker and A. J. Scholl. *Ann. Surg.*, 1924, 80, 739. Abstracted from "Medical Science: Abstracts and Reviews," 1925, xii, 1, 35-6.

This is a long paper dealing with caudal and trans-sacral anæsthesia, the chief interest arising from the fact that a large number of operations were performed, namely, 1,817, with only 5.33 per cent. of failures. This is the most successful series of cases yet reported. There is an account of the anatomy of the sacrum and its variations, deduced from a study of 100 anatomical specimens. The most common variation found in the sacrum is that of six segments instead of five. A sacrum of four segments is much rarer. It is very unusual for the posterior sacral foramina not to be accessible to the needle on account of the growth of the bone.

The technique followed by the authors is essentially the same as that reported by other investigators. The strength of novocaine used is 1 per cent. in normal individuals and 0.5 per cent. in feeble patients. For blocking the sacral canal and sacral foramina 75 to 140 ccm. of ½ per cent. solution are necessary, or 60 to 100 ccm. of 1 per cent. Morphia and scopolamin are given before operation. Sacral block with regional anæsthesia above the pubes in prostatectomy gives a lower mortality than the general or spinal methods. For resection of the bladder in cases of carcinoma or diverticulum, it is often necessary to supplement with ether as the field of operation extends upwards to the abdomen. Caudal anæsthesia nearly always allows of a painless cystoscopy but, with sacral block in addition, the most difficult tuberculous bladders will allow of proper examination. The method has been very useful in operations on the rectum from below, and in gynæcological operations. In obstetrical work it relieves pain and is often the means of avoiding a tear of the perineum. The great difficulty of its use in this connexion is to settle on the right time for injection. There is a tendency to use it too early in the case of primipara and too late in the case of multipara. For this reason the injections have to be repeated in many obstetrical cases. Sacral injections are also used for therapeutic purposes. A large proportion of cases of sciatica have definitely improved, but no alleviation of urinary disorder such as incontinence and enuresis could be established. Undesirable complications and sequelæ are exceedingly rare in sacral anæsthesia, and in no case was there any permanent or lasting trouble.

The cholesterol content of the blood in relation to genito-urinary sepsis. W. MacAdam and C. Shiskin. *Brit. Jl. Surg.*, 1925, 12, 435—443. Abstracted from "Medical Science: Abstracts and Reviews," 1925, xii, 1, 44.

This paper is concerned with an attempt to ascertain, by examination of the blood, the resistance shown by patients suffering from urinary obstruction to post-operative renal infections. The authors hold the view that the mortality of operations for the relief of urinary obstruction caused by disease of the prostate is due as much to renal infection as to renal insufficiency. Estimation of the cholesterol content of the blood is the method employed for the determination of the probable resistance of the patient. The average normal cholesterol content of the blood is 0.160 per

cent. A lower figure than 0.130 per cent. is said to indicate a lack of resistance to infection. A series of 88 cases is considered—74 of benign enlargement of the prostate and 14 of carcinoma. Eighteen cases showed a blood cholesterol of less than 0.126 per cent. Of these 16 died of renal infections, three only having been submitted to prostatectomy and seven to cystotomy, while the remaining six were treated by catheterization. Of the 16 patients only 10 were considered clinically as bad surgical risks. The remaining 70 cases of the series showed a blood cholesterol of over 0.130 per cent. Of these 11 died, all of whom had been submitted to operation. Post-mortem examinations were made on 10 of these cases, and one only showed evidence of renal infection.

In a series of 15 cases with a grossly high blood urea those with a high cholesterol value reacted well to suprapubic drainage, while of eight cases with a low cholesterol value seven died either after cystotomy or without operative interference. It is noted that any operative procedure is likely to produce a fall in the blood cholesterol and also that the presence of malignant disease by itself appears to produce an increased content. These facts mnst be taken into consideration in assessing the significance of cholesterol estimations. A. J. GARDHAM.

The sexual glands and metabolism. I. Influence of castration on nitrogen and gaseous metabolism. V. Korenchevsky. *Brit. Jl. Exper. Path.*, 1925, 6, 21. Abstracted from "Medical Science: Abstracts and Reviews," 1925, xii, 1, 54.

In most cases removal or hypofunction of the sexual glands in animals as well as in human beings is followed by an increase in weight and an accumulation of fat ("fat" castratus or eunuch). However, in approximately 40 per cent. of cases, castration or hypofunction of the gonads and ovaries does not produce this effect ("thin" castratus or eunuch). The author's experiments showed that both nitrogenous and, in most cases, gaseous metabolism were decreased after castration in "fat" castrated dogs. In "thin" castrated dogs this fall in the nitrogenous and gaseous metabolism was usually less pronounced or absent; moreover, the gaseous metabolism was sometimes considerably increased. Nitrogen metabolism of fasting dogs and rabbits was much lowered after castration in all the cases investigated, but the gaseous metabolism did not change at all, or was only a little decreased, or was even increased. The fall after castration in the nitrogen metabolism of the fasting animal when compared with that of the same animal while feeding is always much greater; the converse was noticed in the gaseous metabolism. All the facts mentioned show that not only an accumulation of fact, but also a retention of protein in the body, are the causes of the increased weight of "fat" castrated animals.

The experimental results obtained in this investigation, and the other experimental and clinical data concerning the internal secretion of the sexual glands, suggest the presence of specific hormones in those glands which influence the body metabolism. The question whether the sexual hormones influence metabolism, directly or indirectly, through the other glands of internal secretion, cannot be definitely stated at the present time.

As an explanation of the different results of castration upon metabolism the following hypothesis is suggested: these results are due not only to the direct influence upon metabolism of the removal of the sexual glands, but also to the secondary changes produced by castration in the thyroid,

hypophysis, adrenals, and pancreas, as well as to the varying degree of functional efficiency of these glands before castration. AUTHOR.

Serological latency in florid, manifest syphilis in infants. G. Ahman. *Hygeia*, 1924, 86, 725. Abstracted from "Medical Science: Abstracts and Reviews," 1925, xii, 1, 63.

Ahman has found that infants with clinically unmistakable signs of active congenital syphilis may not infrequently give a negative Wassermann reaction. In some cases this negative reaction was soon followed by a positive reaction which remained so during the first phase of specific treatment, becoming negative again only after this treatment had been continued for some time. Among 73 infants with definite clinical signs of syphilis there were seven whose Wassermann reaction was negative before specific treatment was instituted. The reaction remained negative under treatment with mercury. Ahman adds that various other observers (E. Hofmann in *Deutsche med. Wochnschr.*, 1923, 49, 753, and A. B. Marfan in *Presse Méd.* for 1923) have found that the blood of newborn infants with definite clinical evidence of syphilis may give a negative Wassermann reaction of some time. C. LILLINGSTON.

The results of the prophylactic, post-operative, radiological treatment of carcinoma of the uterine cervix at Radiumhemmet in Stockholm. A. Westman. *Acta. radiologica*, 1924, 3, 502-7. Abstracted from "Medical Science: Abstracts and Reviews," 1925, xii, 1, 87.

Since primary radiological treatment of carcinoma of the cervix, by reason of the good results therefrom in Sweden, is pushing into the background the prophylactic, post-operative variety of radiological treatment, the author has thought fit to determine the experience of the Radiumhemmet in Stockholm in this respect. Between 1914 and 1922 at this institution 29 cases of carcinoma of the uterine cervix were treated (and their progress followed up) which had been given prophylactic radiological post-operative treatment. This had been either vaginal radium radiation alone with heavily-screened preparations, or combined radium and X-ray treatment, or percutaneous and vaginal X-ray treatment alone. The radium treatments were carried out with tubes containing on an average 140 mgm. Ra Br_2, screened with 3-4 mm. lead, and applied in the vagina for about 20 hours. The X-ray treatments were applied in series; usually four portals of entry were used, and to each an erythema dose was given. At first the filter was 3-4 mm. aluminium, but more recently 0.5 mm. copper, and the skin-focus distance was increased from 20 to 24-30 cm. Westman divides the cases into five groups according to the length of time they had been under observation (five years to one year) and gives details of each. Of 12 cases that were observed at least five years, four were free from recurrences. Only six of the 12 were, however, radically operable. Of six operable cases examined three years after the operation, five were entirely free from symptoms. These figures support the comparatively high percentage of cures indicated by the large series of Warnekros, and suggest that radiological post-operative treatment should complete the surgical procedure. W. S. LAZARUS-BARLOW.

Relations between B. melitensis and B. abortus. B. Polettini. *Ann. d'ig.*, 1924, 34, 701. Abstracted from "Medical Science: Abstracts and Reviews," 1925, xii, 1, 65.

B. melitensis and *B. abortus*, though endowed with the same cultural

characteristics and the same pathogenic power for guinea-pigs, give different serological reactions. These are not very marked, but constant, and sufficient for distinguishing two given strains from one another. C. DA FANO.

Permeability of the rabbit placenta to precipitins and to typhoid agglutinins M. F. Guyer and E. A. Smith. *Jl. Infect. Dis.*, 1924, 35, 567—572. Abstracted from " Medical Science : Abstracts and Reviews," 1925, xii, 1, 68.

This is a re-examination of the question whether antibodies pass from the mother to the fœtus through the placenta in rabbits. The blood of fœtal rabbits was found to show precipitin reactions towards proteins such as sheep-serum, which had been injected into the mother. Agglutinins to typhoid bacilli were also found to traverse the placenta. W. BULLOCH.

Tuberculosis and fertility. M. Kacprzak. *Am. Jl. Hyg.*, 1924, 4, 605. Abstracted from " Medical Science : Abstracts and Reviews," 1925, xii, 2, 115.

The material is from the School of Hygiene and Public Health, Johns Hopkins University, and amounts to 9,855 marriages (tuberculous and control). The conclusions are as follows :—

(1) Any kind of tuberculous mating gives a smaller total number of pregnancies than a non-tuberculous.

(2) Maternal tuberculosis has a greater influence on the number of pregnancies than paternal.

(3) The lower absolute number of offspring for each completed tuberculous family, as compared with the non-tuberculous, is largely due to early death of the tuberculous. Slightly to a greater number of abortions and miscarriages in the tuberculous.

(4) The fertility of marriage is enhanced by tuberculosis of either of the consorts.

(5) The mating of a tuberculous man with a non-tuberculous woman shows an increased fertility at all ages.

(6) The mating of a tuberculous woman with a non-tuberculous man shows in all age groups a higher fertility than when both parents are non-tuberculous.

(7) The mating of both partners tuberculous seems to show a higher fertility than the mating of both non-tuberculous. This is more apparent in the consorts who completed their married life before 40. W. C. RIVERS.

Serological proof of congenital syphilis by means of fœtal organs. O. Thomsen. *Acta path. et microbiol. Scandinavica*, 1924, 1, 139. Abstracted from " Medical Science : Abstracts and Reviews," 1925, xii, 2, 153.

If a saline extract is made of a syphilitic infant's organs and incubated with complement, subsequent addition of sensitized corpuscles will show that the extract is strongly anti-complementary. This result is not obtained with non-syphilitic organs. The anti-complementary action is specific to syphilis.

The explanation of this phenomenon is that the extract contains, of course, tissue fluids and blood fluids rich in Wassermann reacting substances, and, therefore, in the anti-complementary test are present not only antigen and complement but also syphilitic reagin. The phenomenon is thus a Wassermann reaction, specific for syphilis and useful for diagnosis post-mortem when blood cannot be obtained.

This paper throws light on early difficulties with the antigen for the Wassermann reaction. Extracts of many syphilitic livers had to be tested before one was found without "Eigenhemmung," or sufficiently without to allow the test to be worked, that is to say, without reagin in the body fluids. The author suggests that Wassermann and his co-workers must have worked with extracts in which reagin content happened to be small, but states that he himself has not met with such in syphilis.

[Perhaps Wassermann's antigens were really non-specific.—REVIEWER.]

P. FILDES.

The action of weak irradiation of the ovary in the light of animal experiments. On stimulative irradiation of the ovary and temporary sterilization. F. C. Geller. *Strahlentherapie,* 1925, 19, 22-61. Abstracted from "Medical Science: Abstracts and Reviews," 1925, xii, 2, 172.

After a *résumé* of the chief literature on the subject the author describes his own experiments. These were carried out on rabbits and rats and a full description, along with a large number of photographs, is given of the appearances found. He concluded that under an exposure of 5 per cent. of the skin erythema dose the ovary shows no alterations. With 10 per cent. there was diminution in size and number of the primary follicles, whereas follicles in a non-advanced stage did not differ from those of the control animals. With 20-30 per cent. the ovaries were usually smaller than those of the controls; atresia of follicles was increased and affected all stages of follicles. Primary follicles were always (and very early after irradiation) much reduced in number, and such as were present were regenerated. At a later date young ripening follicles were found, though these frequently showed degenerative changes. The interstitial gland substance was equally developed in irradiated and control animals. After irradiation of uterus and ovaries or uterus alone, with 5 to 10 per cent. of the erythema dose, the uterus showed no change, but after 20-30 per cent. there was definite hyperplasia, particularly of the mucosa, in which there was a more or less pronounced decidual reaction. With irradiation of the ovaries alone this uterine hypertrophy sometimes was wanting. In about 75 per cent. of the irradiated animals the weight ratio was increased and growth in length was diminished. No changes were observed in secondary sex characters, nor was there histologically any evidence of retrogression of the hypophysis. These results are then compared with those observed clinically in the human subject. There is a good bibliography. W. S. LAZARUS-BARLOW.

Stimulation of growth in children doing poorly on the breast by addition of small amounts of protein to the feeds. H. Langer and S. Schmal. *Ztschr. f. Kinderheilk.,* 1925, 93, 80-88. Abstracted from "Medical Science: Abstracts and Reviews," 1925, xii, 5, 369.

A number of wet-nursed children were found to show inadequate or arrested growth, although the calories supplied as estimated from the fluid ingestion were adequate, and in some cases reached values of 150—200 calories per kilo. The children were from one to five months old, and showed no fever or gastro-intestinal disturbances. The period of arrested increase in weight lasted from three to four or more weeks, and was not therefore a temporary, physiological, arrest of growth. The milk of the wet-nurses showed on analysis a protein content of 0.93 to 1.72 per cent. with an average value of 1.16: the mean of samples from individual wet-

nurses varied from 1.01 to 1.42. These may be regarded as normal values, and similar figures were obtained in the milk of wet-nurses supplying children who showed good growth. The fat content was more variable, ranging from 2.5 to 5.7 per cent. with a mean of 4.05 : these fat variations would account for considerable differences in caloric value, but no relationship could be found between poverty in fat and failure of growth. The suggestion that the child may only take the initial fat-poor milk could be excluded, since the children were nursed on one breast at a time, which they fully emptied. Addition of moderate quantities of salt to the feeds was ineffective, but the addition of small quantities of protein, for instance 10 gm. of plasmon, to the feeds led to a rapid increase of weight, the composition of the milk remaining constant. This did not occur in children after the fourth month of life. The weight increase occurred with mechanical regularity and was not affected by a reduction in the total calories ingested, which more than compensated for the small caloric value of the added protein. Vitamin additions to the diet are of no value in these cases. The authors attribute their findings to the existence of an abnormal demand for protein in certain infants. O. L. V. DE WESSELOW.

Contributions to problems of gynæcology and carcinoma. H. Rieger, E. Opitz, and others. *Dr. A. Theilhaber's Festschrift.* Abstracted from "Medical Science : Abstracts and Reviews," 1925, xii, 5, 385.

The Festschrift, entitled *Beiträge zu Problemen der Gynäkologie und des Karcinoms,* which was presented to Dr. Theilhaber of Munich on the anniversary of his 70th birthday, while recounting the numerous contributions that he has made towards the progress of gynæcology, recalls more especially the part he played in placing our views on the nature of cancer on a more satisfactory basis. At a time when it was customary to regard cancer as a strictly local disease, and when observers were engaged in a search for some tangible cause, such as a coccidium or bacillus, he perceived that the problem was one of much wider scope and involved the study of the mutual relations of tissue to tissue throughout the body. Although no one can at present pretend to understand the nature of cancer, it may at least be claimed that the problem is now being approached on right lines, and it is Theilhaber's merit to have pointed these out long ago. Opitz, in a contribution to the Festschrift dealing with this subject, takes occasion to sum up our present knowledge of the ætiology of cancer and indicate the trend of opinion as regards its nature. Concerning the origin of cancer it may be regarded as proved that heredity plays a part in the form of transmitting a predisposition to the disease. This has been shown very clearly in animal experiments : in man, on the other hand, although in certain cases hereditary transmission is distinctly traceable, it is manifestly of minor ætiological importance in the majority of cases as compared with other causes. A second undoubted factor is age ; the vast majority of cases occur between the ages of 45 and 60, a sudden fall in the curve being observed before 45, and a more gradual decline after 60. Apparently, therefore, it is not so much old age as the onset of ageing of the tissues that is of importance in this connexion. Theilhaber has devoted much study to the changes which occur in the connective tissues as the result of ageing. The condensation of the tissue, and the diminished vascularity and cellular content which characterize these changes, are somewhat analogous to those occurring in the process of cicatrization and the fibrosis

associated with chronic inflammation; and it is possible that the frequent association of cancer with scars and chronic ulceration is due to the existence of conditions resembling those leading to ageing of the tissues. Thirdly, although there is no doubt of the influence of local irritation, the important reservation has to be made that irritation will not induce cancer in the majority of cases, but only in relatively few. In the case of animal experiments, certainly, it is claimed that sufficiently long-continued irritation will always lead to cancer-formation; in the human subject, however, the experimental conditions are very rarely reproduced. Whether organs which lie outside the direct influence of the irritant become subject to cancer (as appears to be the case in the vesical cancer of aniline workers) is at present undecided. In the fourth place it is generally accepted that a definite individual constitution, characterized by a tendency to tumour-formation generally, may underlie the outbreak of cancer; and the important influence of individual differences, apart from age and the other causes mentioned above, is fully recognized in animal experiments on cancer-formation. Recent experiments appear to prove that a living virus is not necessary to the production of cancer, although it may, doubtless, be argued that the agents employed (tar, spiroptera, etc.) prepare the way for some widely distributed micro-organism. But even these experiments seem to point to some fundamental alteration of the metabolism of the body as being a necessary preliminary to the production of cancer. It is well known, for instance, that the irritation needs to be long continued, and that both in man and animals the result may be merely a non-malignant growth, which becomes transformed into cancer only under certain conditions. Turning to cancer cells themselves, it is clear that they exhibit marked changes in metabolic activity as compared with normal tissues. When grafted into another animal they often grow with absolute certainty, a property that is not possessed by any but embryonic tissue; they exhibit an extraordinary power of resistance to external influences, such as heat and cold, and to irradiation when applied to cells outside the body; and they are able to invade and destroy the surrounding tissues. In speaking of cancer cells it is usual to confine the term to cells of epithelial origin; there is, however, every reason to believe that the connective tissue is also involved in the change. It is rare to find the proliferation of the epithelium unaccompanied with that of the connective tissue; some would maintain that the latter is an invariable precursor of the former, and it is known that the connective tissue associated with a transplanted growth will sometimes assume sarcomatous characters.

From the above considerations it would therefore appear that the primary factor in the ætiology of cancer is some definite alteration in the metabolism of the whole body. The formation of a conception of the nature of cancer, based on the foregoing considerations, is facilitated by reference to recent researches on tissue-growth. It has been shown, by the artificial culture of tissue *in vitro*, that the form assumed by a growing tissue is altered if another tissue is introduced into the culture. Thus epithelial cells, when grown alone, produce an even undifferentiated layer; when grown in association with connective tissue they arrange themselves in tubes or acini, typical of their organ of origin. The structure of the resulting tissue appears to depend on the interaction of the tissues present. If, then, it is accepted that widespread alterations of metabolism are present in cases of cancer, it may be conceived that the cancerous tumour itself takes

the form of tissue-growth naturally arising from the interaction of the altered tissues. In other words, among the numerous mutations in metabolic activity that the tissues undergo, a certain combination arises which is expressed in the form of cancerous growth. Theilhaber's view differs somewhat from this. He considered that the metabolic changes result in lessening the immunity of the connective tissues to invasion by epithelial cells. The practical result, however, is the same; in the treatment or prevention of cancer, attention to the general metabolism of the whole body is held to be of prime importance. T. W. P. LAWRENCE.

Septicæmia in man due to B. abortus. G. Ficai and A. Alessandrini. *Ann. d'ig.*, 1925, 35, 1. Abstracted from "Medical Science: Abstracts and Reviews, 1925, xii, 5, 411.

This is an excellent paper, in which the question summarized in the title is discussed from the historical, clinical, epidemiological and experimental points of view. The authors' conclusions are as follows: in spite of many statements to the contrary *B. abortus* (Bang) and *Micrococcus melitensis* (Bruce) can be distinguished from one another owing to the existence of certain morphological, biological and serological differences. In comparison with the "anti-Bruce" agglutinins, the "anti-Bang" agglutinins are thermostable. There are sera which agglutinate only *B. abortus*, that is to say, do not contain group agglutinins for *Micrococcus melitensis*. *B. abortus* can occasionally be recovered in pure culture from the blood and morbid foci in human cases. C. DA FANO.

Heart disease as a complication of pregnancy, labour and the puerperium. K. Beirring. *Ngeskr. f. Læger.*, 1925, 87, 95. Abstracted from "Medical Science: Abstracts and Rviews," 1925, 3, 185.

The material studied were the 9,800 women admitted to a maternity hospital up to October, 1922. Amongst them there were 87 who suffered from heart disease, and as several of these patients were confined more than once, there was a total of 107 confinements complicated by heart disease, *i.e.*, in 1.09 per cent. of all the confinements heart disease was demonstrable. Mitral insufficiency was found in 48 cases, mitral stenosis in four, and mitral insufficiency plus mitral stenosis in 21. The few remaining cases represented such comparatively rare conditions as acute dilatation of the heart and fibrino-purulent pericorditis. There were 38 primiparæ and 49 multiparæ, the youngest being 17 and the oldest 44 years old. Only in 60 per cent. was there a history of rheumatic fever. There were 53 pregnancies totally undisturbed by the heart disease. In 23 cases there were slight cardiac symptoms which had existed before pregnancy and which were not aggravated by it. There remained 11 cases in which there were severe cardiac symptoms, and among these there were six which ended fatally in connexion with the pregnancy. In about 4 per cent. of all the cases spontaneous abortion occurred, and in about 8 per cent. premature labour. It was among the worst cases of heart disease that the premature spontaneous interruption of pregnancy was most frequent, and the chances of the heart disease giving serious trouble during pregnancy were found to be greatest for elderly multiparæ who had had many confinements. Bierring concludes from his studies that it is seldom desirable to terminate pregnancy on account of heart disease. C. LILLINGTON.

Female sterility and the ductless glands. F. J. McCann. *Practitioner,* 1925, 114, 258—266. Abstracted from "Medical Science: Abstracts and Reviews, 1925, xii, 3, 205.

The writer points out that disturbed correlation of the ductless glands is one of the most important causes of sterility in the human female, and argues that although much of the work on ductless glands is in the experimental stage, it would appear that there is a close correlation between the pituitary, the thyroid, the ovaries, and the adrenals. He then goes so far as to state that disordered menstruation, in the absence of local pathological lesions or gross systemic disturbances, indicates some disturbance of the activity of the ductless glands. The formation of the placenta is pointed out as the development of a new gland which exercises both a stimulating and an inhibiting influence on the other ductless glands. The question of obesity in the female is also discussed in relation to endocrinological causes. Very wisely it is pointed out how inefficient foodstuffs may affect the bodily metabolism and so interfere with endocrine function.

Criticism is also offered on such conditions as super-involutions of the uterus, lactation atrophy, and premature senescence, and how, in some cases, judicious use of certain endocrine extracts have proved of the greatest service. Some interesting observations regarding the influence of marriage on the endocrine glands are noted. I. JONES.

Experimental new growths from the auto-grafting of the uterine mucous membrane. P. Dossena. *Boll. d. Soc. med. chir. di Pavia,* 1924, 26, 584. Abstracted from "Medical Science: Abstracts and Reviews," 1925, xii, 3, 233.

Experiments were made in rabbits and rats in which a small portion of one of the uterine horns was removed and split open. Fragments of the lining mucous membrane were scraped off and allowed to fall in the abdominal cavity of the animals operated upon. These were killed after 70 to 150 days. It was found that the fragments had grown into small tumours, some of which had a papillomatous aspect, while others were characterized by the presence of solid strands of proliferated epithelium; others still had given rise to cystic new growths lined by a layer of high cubical epithelium. C. DA FANO.

Transmission of diphtheria immunity from the female guinea pig to its descendants. C. Zoeller. *Compt. rend. Soc. de biol.,* 1925, 92, 432-4. Abstracted from "Medical Science: Abstracts and Reviews," 1925, xii, 3, 239.

The author has attempted to verify Ehrlich's classical experiments on the transmission of immunity from parents to offspring by studying the facts in guinea-pigs immunized with diphtheria antitoxin. It will be remembered that Ehrlich's experiments were done with abrin and tetanus toxin in mice, which come into the world in a very much more undeveloped condition and are suckled by the mothers for a much longer time than guinea-pigs, which are able to eat their own food from birth. Zoeller found that an immunized female guinea-pig giving milk to the young of a non-immunized mother was unable to convey any passive immunity by suckling. A guinea-pig immunized during lactation bore non-immunized young. If immunization of the mother took place during pregnancy the young were both immune, and the immunity lasted for one, but disappeared in two months, indicating its passive character. Female guinea-pigs immunized

with diphtheria antitoxin before conception threw immune young, which, however, lost their immunity by degrees. Two female guinea-pigs, the one immunized and the other not, threw their young on the same day, and the author changed the litters of the respective mothers in a so-called changeling experiment. The immunized mother suckling the young of the non-immunized mother, did not confer immunity by the milk, whereas the young of the immunized mother, but put to the breast of the non-immunized guinea-pig, preserved for a time the immunity which they had obtained by placental transmission of antitoxin from their own mother.

W. BULLOCH.

Technique and advantages of treatment of hæmorrhagic diseases of the uterus and of fibromata by the method of two large opposite fields. Naland. *J. de radiol. et d'electrol.*, 1925, 9, 91-2. Abstracted from "Medical Science: Abstracts and Reviews," 1925, xii, 3, 249.

The variety of treatment applied to these cases is very great, but the improvements in apparatus having simplified the methods, and for more than a year past the author has used that known as Warnekros' and has arrived at what he calls a more or less universal technique.

(*a*) *Uterine hæmorrhages*: the most penetrating radiation possible, 205 kr., filter 1.3 mm., Cu + 1 mm. al, 40 cm. focus on the skin, a rectangular field 15 + 20 cm. used with a compression pyramid.

The patient is laid on her back, and the rectangular base of the pyramid, which is well centred, is made parallel with the horizontal plane. The normal ray and the vertical axis of the pyramid are then vertical and coalesce. The field is used transversely with its long side perpendicular to the axis of symmetry of the body formed by a pencil mark from the umbilicus to the centre of the symphysis. The normal ray is centred on this line at a distance of 3-4 cm. above the superior border of the symphysis, the compression desired is produced and the first radiation effected.

The patient is then laid prone with the tube under the table, and, using the screen for control at 3-4 cm. above the ortho-diagraphic projection from the middle of the superior border of the symphysis, the foot of the normal ray is marked with a pencil for dorsal radiation. The patient is then placed prone on the operating table and the field of 15×20 cm. transverse, placed exactly as for ventral radiation, is applied with compression to the patient's back. After centring on the point previously found by the screen, the second and final radiation of the first sitting is proceeded with.

(*b*) *Fibromata*: the technique is much the same but modified so as to cover the fibroma as much as possible. The required point will not necessarily be found in the sagittal plane at 3-42cm. above the symphysis, but by the relation of the two axes on the umbilical-symphysis line and another perpendicular to this and tangential to the upper border of the symphysis.

(*c*) *Dose and intervals between treatments*: the author rarely attempts to effect the radiation regarded as necessary at one treatment, but as the result of experience gives three treatments of two fields each with intervals of 2-3 weeks; the dose has to be varied according to the nature of the case; sometimes four treatments are needed, while in other cases two are enough; in thick subjects stronger doses have to be given. Great tolerance of the heavy dosage has always been observed, and the after-effects are quite small.

The advantages claimed are: (*a*) increase of radiation actually transmitted at a depth; (*b*) no need for seeking the exact points of the ovaries,

as the field covers them; (*c*) reduction of the fields used to two, and a certainty, in the case of fibroids, of a thorough radiation of the tumours; (*d*) great saving of time in the handling of the patient; (*e*) great elasticity in the dose, as the case may require, and a relatively precise determination of the quantity given in the depths; (*f*) need for four visits by the patient at most.

The author still regards A. Béclère's method as the best for apparatus of medium power and as giving equally good results with his own, which he claims as the best with modern voltage apparatus. W. NORTH.

Experimental variations in the action of pituitary extract H. Zondek and H. Bernhardt. *Ztschr. f. klin. Med.*, 1925, 101, 312-19. Abstracted from "Medical Science: Abstracts and Reviews," xii, 4, 271.

Zondek had previously observed that the effect of thyroid extract could be modified by calcium, potassium, and pH, and he now reports the effect of calcium and potassium on the action of pituitary extract in restraining diuresis and promoting a concentration of urine. For this purpose he made use of two patients with diabetes insipidus. The urine was collected in hourly specimens for a period of seven hours on a series of days. On the first day no treatment was given and the degree of polyuria defined. On the second day two ampoules of pituitrin ("physonorin") were given intravenously; this effected a marked decrease in the quantity and increase in the concentration of the urine. When the extract was mixed with 100 mgm. KCl in the syringe and immediately injected, the action of the pituitrin was intensified, whereas when 150 mgm. $CaCl_2$ was substituted the action of the pituitrin was almost annulled. When the $CaCl_2$ was injected into one arm and the pituitrin into the other, a normal pituitary effect was obtained.

Confirmation of these observations was obtained by similar experiments on the diuresis of the Volhard water test in normal persons, and by similar tests applied to dogs. It was further observed that when the injections of calcium and pituitrin were repeated, the restraining action of the calcium progressively diminished and might change to an augmenting action; however, if the injections were discontinued for three weeks the original restraining action was restored. When injected separately from the pituitrin the calcium had no effect unless very large amounts were employed.

The authors conclude that potassium and calcium act by altering the colloidal state of the hormone to one more nearly approaching that in which it normally enters the cells, and that the body has in this mechanism the power of modifying the action of pituitrin on the cells to suit their passing needs. G. C. LINDER.

Protein digestion in the infant's stomach. S. Rosenbaum and M. Spiegel. *Jahrb. f. Kinderh.*, 1925, 100, 87-92. Abstracted from "Medical Science: Abstracts and Reviews," 1925, xii, 4, 286.

It is usually assumed that no protein digestion can occur in the infant stomach, since the acidity of its contents does not with customary methods of feeding reach the level requisite for peptic activity. The authors have studied protein digestion by the method devised by Hiss. The stomach contents are removed $1\frac{1}{2}$ hours after a feed, and the filtrable nitrogen estimated at once and after incubation for some hours at 37°. They find that protein digestion occurs in the infant stomach if the protein content of

the feed exceeds that of human milk. The acidity in these conditions is often much below the necessary value for peptic digestion, *in vitro*, the pH in some cases being only 5.8. No increase in the filtrable nitrogen of human milk was noted. Appreciable digestion of high protein feeds may have occurred within four hours of the time of administration, that is, within the period during which cow's milk may remain in the stomach. A reflex of trypsin from the duodenum could be excluded by the absence of bile pigment. They conclude that with high concentration of protein in the diet the infant stomach exercises a proteolytic function in addition to its rôle in regulating the filling of the small intestine.

O. L. V. DE WESSELOW.

A case of endometrioma. W. Komocki. *Frankf. Ztschr. f. Path.*, 1924, 30, 114. Abstracted from " Medical Science : Abstracts and Reviews," 1925, xii, 4, 321.

The term " endometrioma " should be used to indicate certain tumour-like proliferations of the uterine mucous membrane and its glands which were originally investigated by R. Meyer (*Virchow's Archiv. f. path. Anat.*, etc., 1903, 172, 394) and of which Komocki now describes a case. These proliferations are characterized by the fact that they grow both into the cavity and muscular wall of the uterus, without, however, assuming a definitely malignant character. They are sometimes indicated as adeno-myomata, but the use of this term does not appear to be justified because these proliferations could hardly be considered as adenomata, and a multiplication of muscle cells either does not occur or takes place only secondarily, and in a limited way. C. DA FANO.

Epitheliofibrosis and epitheliomyosis of the Fallopian tubes. H. Schridde and L. Schoenholz. *Frankf. Ztschr. f. Path.*, 1924, 30, 338. Abstracted from " Medical Science : Abstracts and Reviews," 1925, xii, 4, 320.

Careful investigations were carried out by the authors on a number of Fallopian tubes surgically removed. The following conclusions were reached :—In the Fallopian tube of the adult a malformation occurs which is characterized by diverticula and reticular proliferations of the mucous membrane; it may be associated with a limited multiplication of either connective tissue or muscle cells. Histological investigations show that it is due to anomalies of development and not to any inflammatory process, of which no traces are found. It could be appropriately termed epithelio-fibrosis or epitheliomyosis of the oviduct, while the name salpingitis isthmica nodosa, which has been sometimes used by previous authors, should be dropped. C. DA FANO.

Results of Roentgen treatment. Statistical report on 800 cases of uterine cancer. H. Wintz. *Deutsche med. Wchnschr.*, 1925, 51, 19-21. Abstracted from " Medical Science : Abstracts and Reviews," 1925, xii, 4, 335.

In this paper the author summarizes the results of eight to nine years' work. He points out the steady improvement in technique during this period and that, as regards these cases, the method of Seitz and Wintz for irradiation of the primary tumour and parametrium have been followed.

From 1915 to 1922 the total cervix cases treated numbered 708 and of the corpus uteri 90. The operable cases numbered : cervix 123, corpus 42; the inoperable : cervix 585, corpus 48; border-line cases are included among the operable.

Deaths attributable to the treatment were less than 1 per cent., viz., six. This cause of death is now practically eliminated by improved technique. All cases which survived five years at least after treatment are classed as " absolute cures." The figures for the whole period are : cervix 612, corpus 88 respectively, the percentages in each year being 25, 25, 50, 28.5, 36.3, 45, *i.e.*, 1915 to 1920 each inclusive. None of these cases at the end of the five-year period showed any signs of carcinoma, and the percentage is reckoned an all cases seen at the clinic, whether treated or not.

" Relative cures."—This group of figures includes all cases treated with Roentgen rays, operable and inoperable combined; cases still living five years after treatment, cervix 458, corpus 60. The percentage in each year 1915-20 being 5.5, 18.0, 14.2, 15.5, 22.0, 22.6 for cervix cases, and 0, 0, 50, 28.5, 36.3, 45 for corpus cases.

The following figures of percentages of operable cases show that from 1915 to 1922 inclusive the percentage for advanced cases has increased greatly—57, 21.2, 12.2, 16.5, 20.3, 10.5, 11.0, 12.0. The fall in the percentage of operable cases in the years 1920-22 is very marked. This may possibly be attributed to war conditions. Winter's relative and absolute figures have been seriously influenced by this fact, so that important improvements in methods of treatment are scarcely appreciable. This also explains the fact that in the absolute cure figures of most clinics there is no very great difference despite great differences of method. The following figures, calculated on Winter's basis, show : operable cases, relative cures, *i.e.*, living on December 1 of the fifth year after treatment, 1916 to 1920 : cervix, per cent. of cases, 57, 40, 52.9, 57, 75; corpus, per cent. of cases, 0, 50, 57, 66.6, 88.8. Inoperable cases, relative cures, on the same basis 1915 to 1920 : cervix, per cent. of cases, 5.5, 12.2, 10.5, 8.1, 12.5, 15.3; corpus, per cent. of cases, none till 1920, when the percentage was 9. It is regarded as more or less a fact that the chief losses in carcinoma cases occur in the first two years, and the following figures are given showing the percentage of cases living on Dec. 1 of the third year after treatment : operable, 1916-21, cervix, 71.4, 50.0, 58.8, 71.1, 83.3, 60.0; corpus, 0, 75, 71.4, 66.6, 88.8, 62.5. Inoperable, 1915 to 1919 none; 1920, 9 per cent., and 1921, 20 per cent. " Inoperable " includes all absolutely hopeless cases. Further tables are given showing the percentages of cases living year by year, omitting hopeless cases.

The value of gross statistics of this kind, especially in a disease like cancer, must be discounted by the fact that the " operable " cases include anything from those in which the disease could only be detected microscopically to cauliflower tumours as large as an egg. Prof. Wintz has found that if cases be collected and grouped so as to be as equal as possible in stage and extent, the percentage living after five years could never be made to exceed 85, and this presumably is meant to apply to the most hopeful group. A large number of inexplicable results are obtained in spite of the best initial conditions and the good general state of the patient.

Prof. Wintz refers to the importance of suitable preliminary and after-treatment, also to the effect that the conditions to which the patient returns may have on the prospect of cure.

In conclusion, he says that the chances of cure depend upon :—

(1) Exact radiation technique with exact dosage and a consideration of the difference of sensibility of different carcinomata.

(2) The earliest possible diagnosis of the existence of the disease.

(3) The locus of the carcinoma and the neighbourhood of organs highly sensitive to Roentgen radiation.

(4) The general life conditions of the patient and medical care before and after radiation.

(5) The possibility of the undisturbed reduction of the carcinoma (Ungestöste Rücksbildungsmöglichkeit). The following are regarded as interfering with the progress towards cure: local infection, traumatic, chemical, or physiological-chemical (internal secretory) irritation, severe general illness, and worry.

(6) The so far unknown attitude of the body towards carcinoma. Absolute failures up to 15 per cent. and even 20 per cent. in initially very favourable cases treated with the utmost care.

NOTE.—Prof. Wintz declares himself entirely in agreement with the principle laid down by Winter (*Zentralbl. f. Gynec.*, No. 31) at the Heidelberg Congress, and the divisions of his report correspond with those of Winter. W. NORTH.

Experiences with Roentgen abortion. M. Ganzoni and H. Widmer. *Strahlentherapie*, 1925, 19, 485—504. Abstracted from "Medical Science: Abstracts and Reviews," 1925, xii, 4, 338.

The interruption of pregnancy, especially in tuberculous women, is a very serious matter; if undertaken there may be, in many cases, a risk by worsening of the disease, and if active steps be taken, not only the health but the life of the woman may be endangered. Some less risky method than those which usually have to be adopted in practice is a very great desideratum, and the Roentgen ray has suggested itself. The older operators, without our present-day knowledge and appliances, found themselves compelled to abandon it by reason of the danger to the patient. Ten years later Archangelsky made use of the method during the early stages up to six or seven weeks, radiating daily till abortion occurred, and, this failing, using the operative method.

The author groups the cases under two heads: (1) Abortion with simultaneous spaying, using two fields for each ovary, both in front and behind, or one field in front and one behind, or a single field in front or the same behind only. Details of the results in 19 cases are given. (2) Abortion without sacrificing the ovaries: radiation absolutely confined to the uterus is necessary, using either two fields, one in front and one behind, or one field from the front. A series of cases is given in illustration. Of 29 cases in Group 1 there were two failures, and the same number among 15 cases in Group 2. A table is given showing the technique used, the object of the treatment in each case, the age of the pregnancy, date of abortion, after the treatment, and duration of the post-abortion hæmorrhage, and also in Group 2, the effect on the senses.

The author summarizes his conclusions as follows: out of 34 cases treated 29 abortions were successfully procured: four failures are set down to technical reasons. The sensibility of the embryo to radiation is independent of its age.

The author was not successful, for anatomical and technical reasons, in obtaining complete conservation of the ovarian functions with any sort of certainty in cases of abortion produced by Roentgen radiation. If the gravid uterus was given a sufficient dose all further development ceased. The abortion dose for the uterus was between 250 and 300 R and apparently

smaller than the definitely spaying doses. Roentgen radiation produces a spontaneous and sterile ejection of the fœtus; the period between radiation and abortion varies from 20—54 days. The methods of temporary or definite spaying is recommended as the best. W. NORTH.

Ovarian activity in relation with menstruation and vasomotor disorders of the menopause. A. Béclère. *J. de radiol. et d'electrol.*, 1925, 9, 124—130. Abstracted from "Medical Science: Abstracts and Reviews," 1925, xii, 4, 343.

Béclère points out that X-rays are not alone a therapeutic agent in respect of the ovaries, but also afford information from the study of cases treated therewith, upon ovarian activity in relation with the menopause, on the one hand, and upon the various congestive disorders that succeed upon a natural or artificial menopause on the other. He gives short details of 38 illustrative cases and therefrom comes to the following conclusions: (1) The various disorders symptomatic of spontaneous or induced menopause, particularly the characteristic vasomotor troubles known as "flushings," are not due to retention in the blood of some substances which would normally be eliminated by menstruation. (2) The proof of this statement is that in cases of temporary menopause induced by X-rays disappearance of the characteristic symptoms invariably precedes the return of menstruation sometimes by a minimum period of a week and sometimes by several weeks or even months. (3) In case of temporary menopause the premature and occasionally sudden disappearance of these characteristic symptoms is the first indication of the re-awakening of ovarian activity, or, more exactly, of the resumption of activity and development of certain primordial follicles that had remained intact, but until then had been quiescent and in a state of latent activity. (4) The persistence of "flushings" is usually incompatible with re-awakening of ovarian activity, and therefore with the return of menstruation. (5) This incompatibility is such that after induced or spontaneous menopause the reappearance of loss of blood, even though it present the habitual characters of menstruation, must not be regarded, except after most careful consideration, as a return of menstruation if flushings persist. The cause of the loss of blood must always be suspected and sought in the existence of an intra-uterine lesion, such as a polypus undergoing expulsion, a submucous fibroma, or a carcinoma of the fundus, assuming the cervix to be normal. In such a case the persistence of "flushings" and their co-existence with metrorrhagia is an important sign in the differential diagnosis between a real menstrual flow and uterine hæmorrhage independent of ovarian activity.

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